

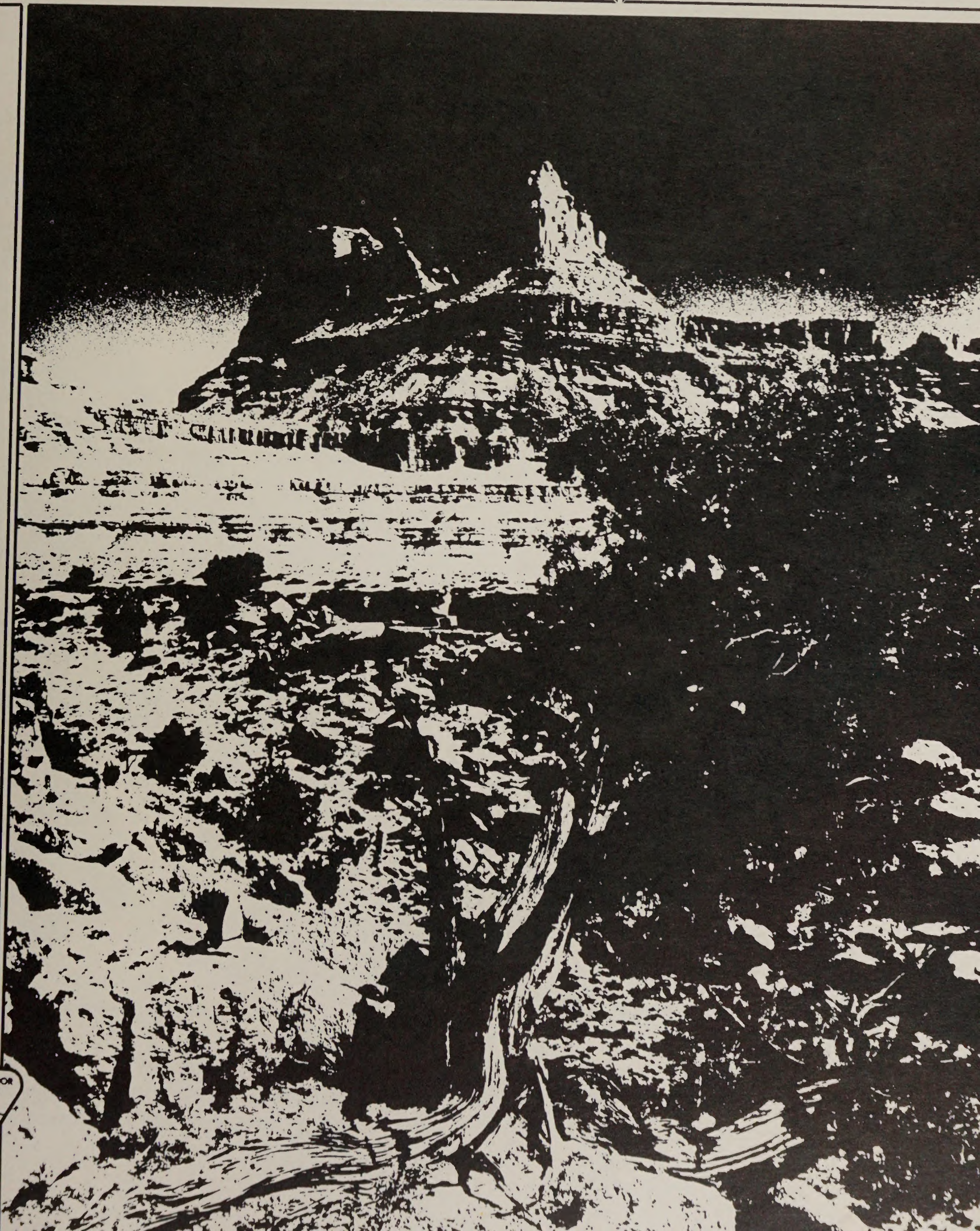


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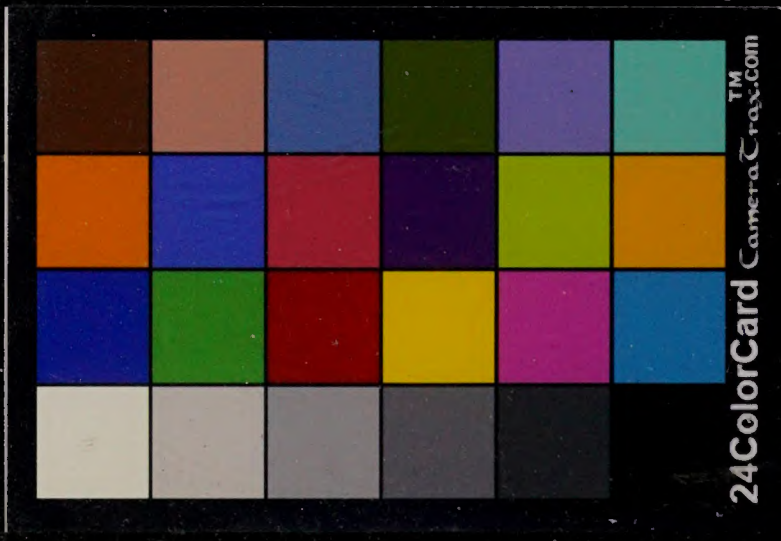
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Volume I Overview

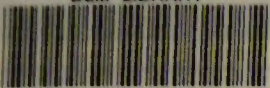


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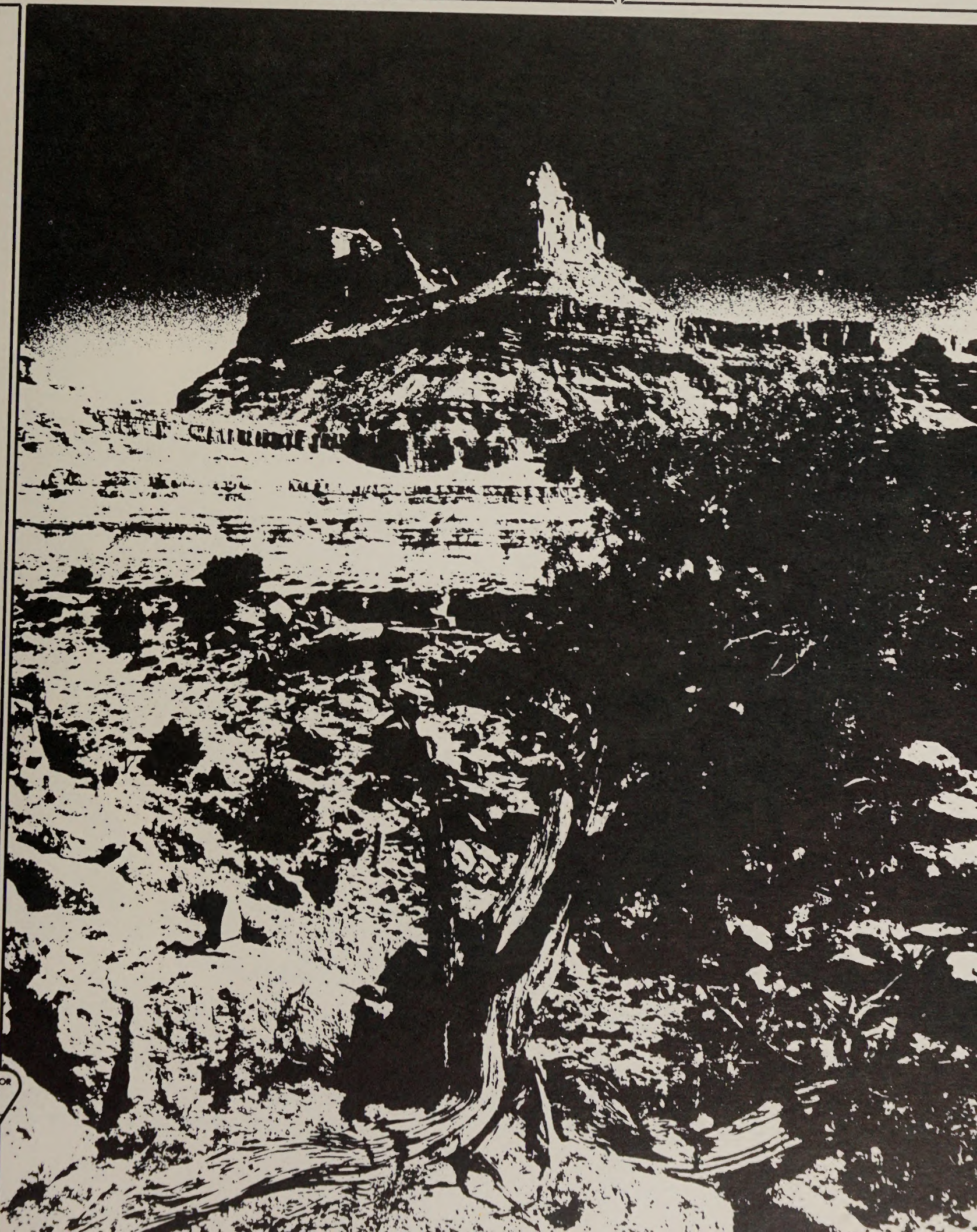


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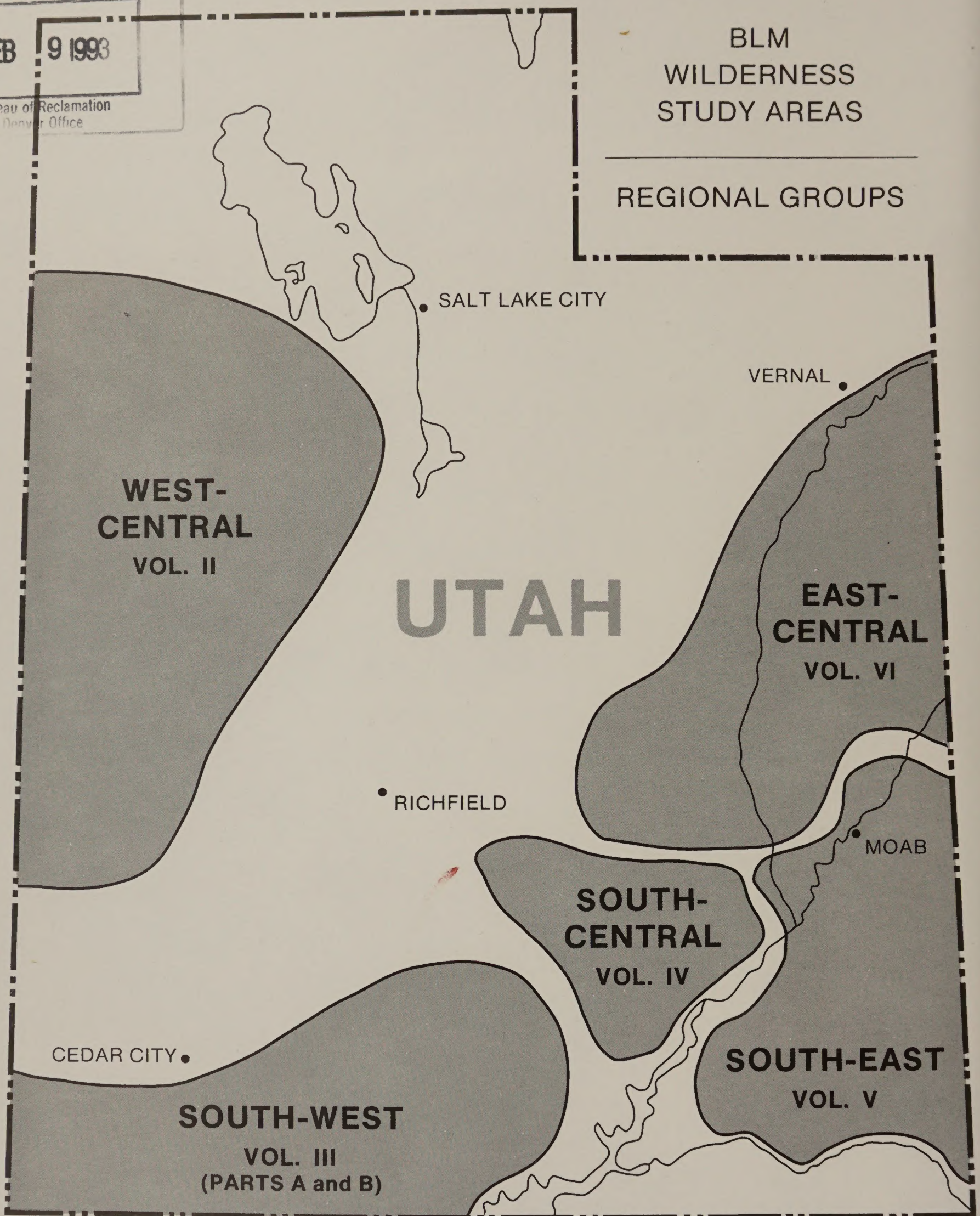
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BLM
WILDERNESS
STUDY AREAS

REGIONAL GROUPS



This is **Volume I** of a seven volume set. Volume I is the state wide overview. It contains the Glossary and Appendices for all volumes. Volumes II-VI contain analyses for individual Wilderness Study Areas. Volume VII (parts A and B) contain public comments and responses.

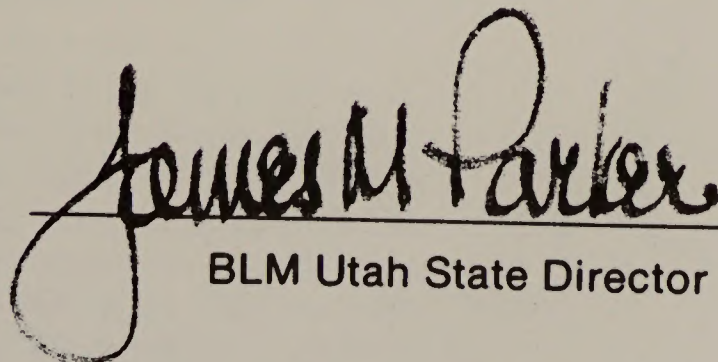
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Utah BLM Statewide Wilderness Environmental Impact Statement

Final

Prepared by
Utah State Office
Bureau of Land Management
U.S. Department of the Interior

1990


BLM Utah State Director

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Utah BLM Statewide Wilderness Environmental Impact Statement

Draft () Final (X)

Lead Agency: Department of the Interior, Bureau of Land Management.

A. Type of Action:

Administrative () Legislative (X)

B. Abstract: The Bureau of Land Management (BLM) proposes to recommend to the Secretary of the Interior 1,975,219 acres of public land in 66 Wilderness Study Areas (WSAs) as suitable for wilderness designation and 1,260,615 acres as unsuitable for wilderness designation. The Utah BLM WSAs analyzed are located in all five Utah BLM Districts; however, nearly 87 percent of the WSAs are in the southern half of the State. This document analyzes the environmental consequences of the BLM Proposed Action and five Statewide alternatives ranging from all wilderness to no wilderness for the WSAs. It contains analysis of 83 individual WSAs. Also, it documents the Utah BLM wilderness study, including public participation, and provides information for land use planning, wilderness suitability recommendations, and Congressional decisionmaking.

C. Alternatives: The six Statewide alternatives analyzed in detail are:

1. BLM Proposed Action
(Designate 1,975,219 acres).

2. No Action/No Wilderness Alternative
(Designate no acres).
3. Regional Representative Areas Alternative
(Designate 956,616 acres).
4. Paramount Wilderness Alternative
(Designate 1,533,030 acres).
5. Cluster and Interagency Areas Alternative
(Designate 2,486,732 acres).
6. All Wilderness Alternative
(Designate 3,235,834 acres).

D. For further information contact:

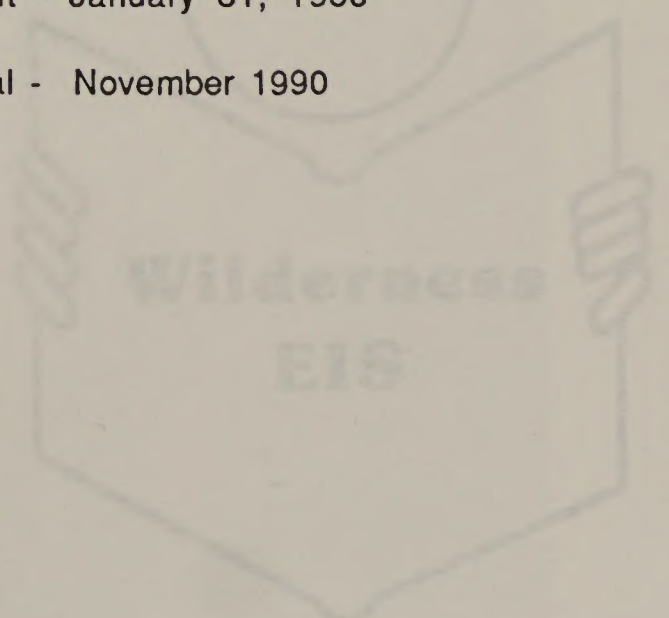
Dr. Gregory F. Thayne, EIS Team Leader
Bureau of Land Management (U-933)
Utah State Office
324 South State Street, Suite 301
P. O. Box 45155
Salt Lake City, Utah 84145-0155

Telephone (801) 539-4063

E. Date Environmental Impact Statement made available to EPA and the public:

Draft - January 31, 1986

Final - November 1990



READERS GUIDE

The Document

The Utah Statewide Wilderness Final Environmental Impact Statement (EIS) is comprised of seven volumes, which comprise a Statewide overview and an individual analysis of each of the 83 Wilderness Study Areas (WSAs), including several WSA/Instant Study Area (ISA) complexes. The Statewide overview is Volume I. The individual analyses are grouped into volumes by location, as follows:

- Volume II: West-Central Region (11 WSAs)
- Volume III (Part A and Part B): South-West Region (30 WSAs)
- Volume IV: South-Central Region (10 WSAs)
- Volume V: South-East Region (16 WSAs)
- Volume VI: East-Central Region (16 WSAs)

Table 2 in Volume I lists the WSAs analyzed in Volumes II through VI. The Glossary and Appendices referred to in the individual volumes are located in Volume I.

Volume VII (Parts A, B, and C) contains the responses to public comments on the Draft EIS. Both General and Specific comments are included.

The EIS is a summary of a large body of technical data. If additional information is required regarding the specific location of resources, intrusions, etc., in WSAs, the reader should contact the appropriate BLM District. The reader should be aware that even though the WSAs presently are managed under the BLM Interim Management Policy (IMP) (USDI, BLM, 1979a), which restricts some activities, the Affected Environment sections of the EIS describe the environment as it would be managed under BLM land use plans without the temporary protection of the IMP.

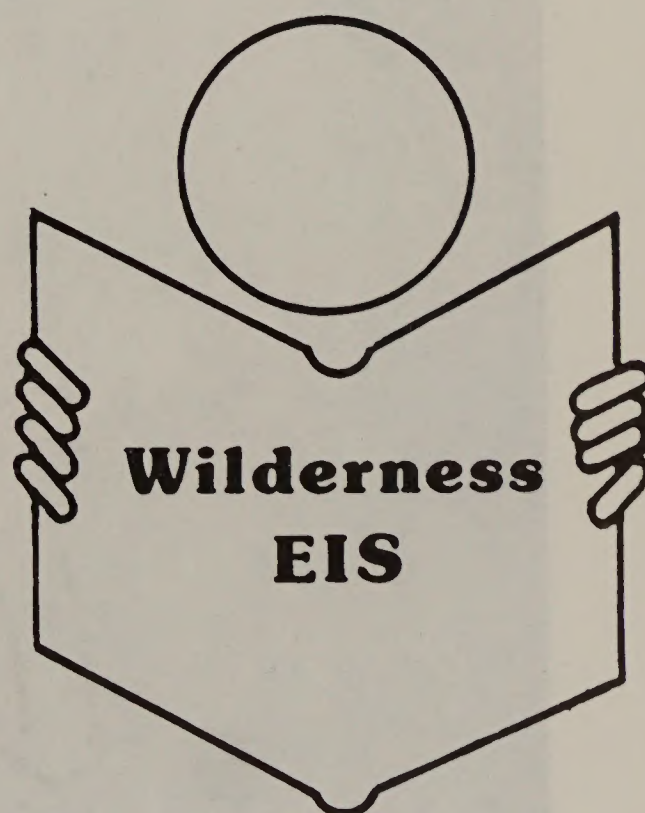
The Analysis of wilderness designation is somewhat problematical because of uncertainties relative to the future use of nonwilderness resources. Specific analysis assumptions are provided in the Description of the Alternatives and the Introductions to the Volumes. Only activities and resource uses historically identified or judged as "reasonably foreseeable" are analyzed. An attempt has not been made to speculatively identify and analyze all possible future activities and resource uses in the WSAs. Wilderness designation likely would continue over a long period of time. Advances or changes in technology or economic conditions could make certain resources more or less valuable than at present. Therefore, by necessity, the BLM analysis conclusions in the Final EIS are based on

available data but are subjective in relating the potentials or probability of changes in management or development of resources within the WSAs in the future.

The Purpose

The purpose of this EIS is to: (1) document the environmental analysis carried out by BLM as part of the wilderness study; (2) provide public information; (3) summarize information for BLM and the Secretary of the Interior as part of the process for planning and determining wilderness suitability recommendations; and (4) provide information for Congressional decisionmaking.

The Utah Statewide Wilderness Final EIS will be accompanied by individual Wilderness Study Reports (WSRs) for each WSA. Both the Final EIS and the WSRs will reflect the final BLM recommendations with changes, if any, requested by the Secretary of the Interior. Subsequently, the proposal of the Department of the Interior will be forwarded to the President and Congress through the established legislative process.





A single ridge, the leading edge of an eastward-tilted fault block, and divergent vegetation and topography dominate the landscape of the North Stansbury Mountains WSA.



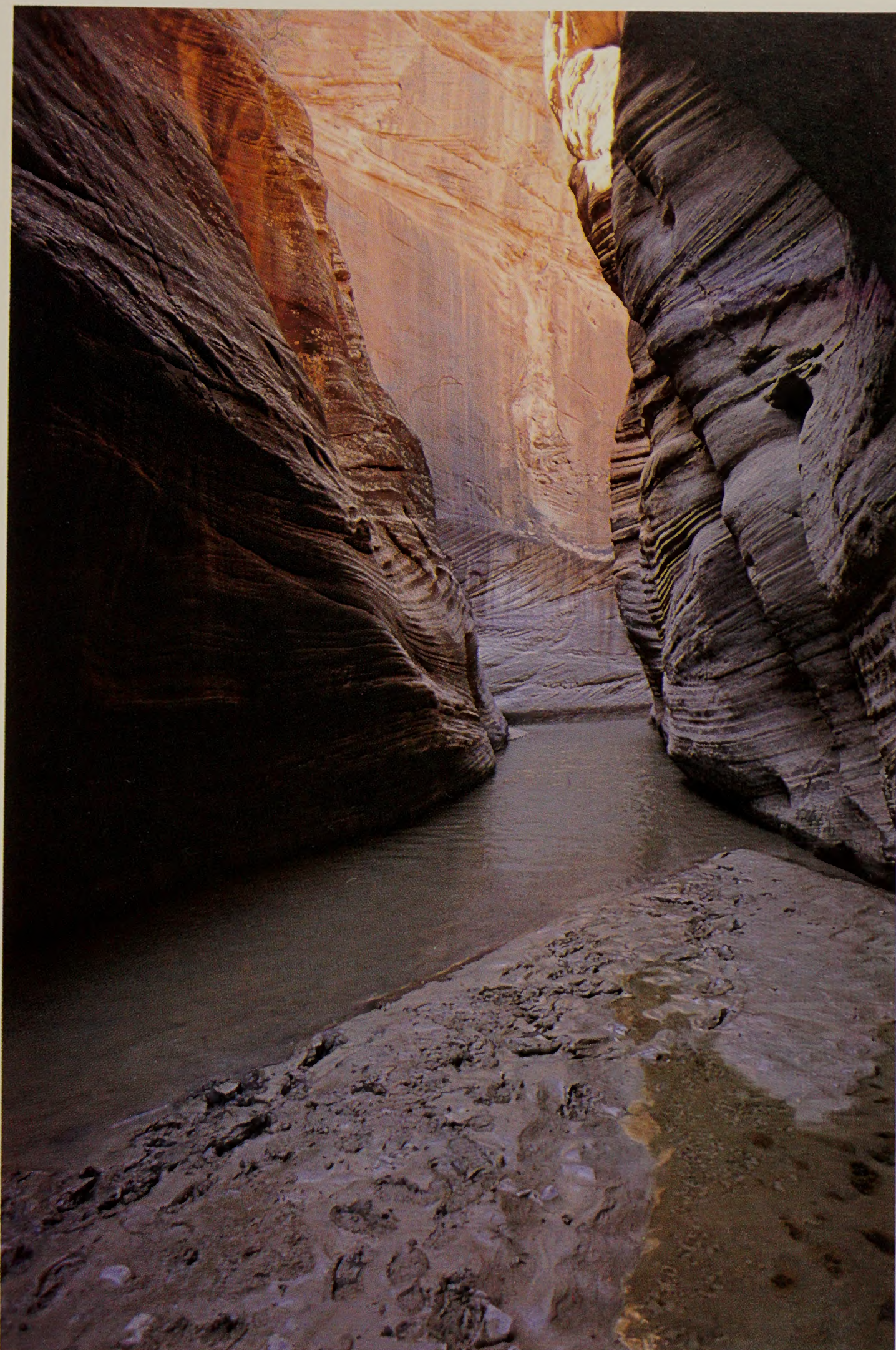
Snow-covered Ibapah Peak, the range's highest peak, in the background in the Deep Creek Mountains WSA.



The west-facing, extremely steep, tilted fault block, typical of Basin and Range topography in the Notch Peak WSA.



Basin and Range blockfaulting in the Wah Wah Mountains WSA.



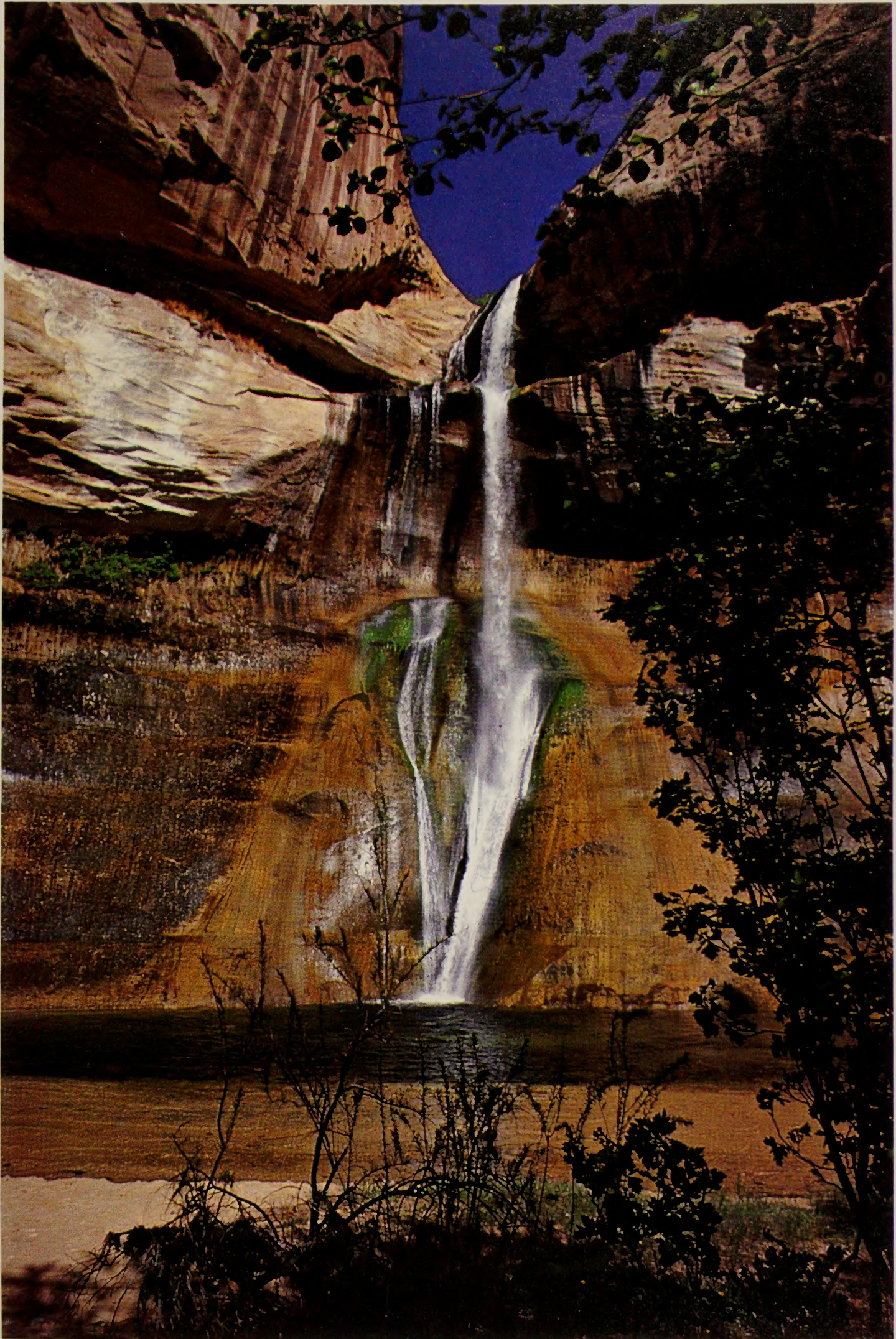
Steep canyon wall in the East Fork of the Virgin River Canyon in the Parunuweap Canyon WSA.



Canaan Mountain WSA from the head of South Creek Canyon, one of the four major canyons in the WSA.



Mollie's Nipple, an erosional remnant and prominent landmark, on the horizon in the Paria-Hackberry WSA.



Lower Calf Creek Falls located in the Calf Creek drainage in the Phipps-Death Hollow ISA Complex.



The Gulch, one of the major drainages in the Steep Creek WSA.



The Escalante River showing the vertical walls and some of the many bends and meanders in the North Escalante Canyons/The Gulch ISA Complex.



Dry Fork of Coyote Gulch in the Scorpion WSA.



The southwest side of Fifty Mile Mountain WSA showing the plateau incised by numerous drainages.



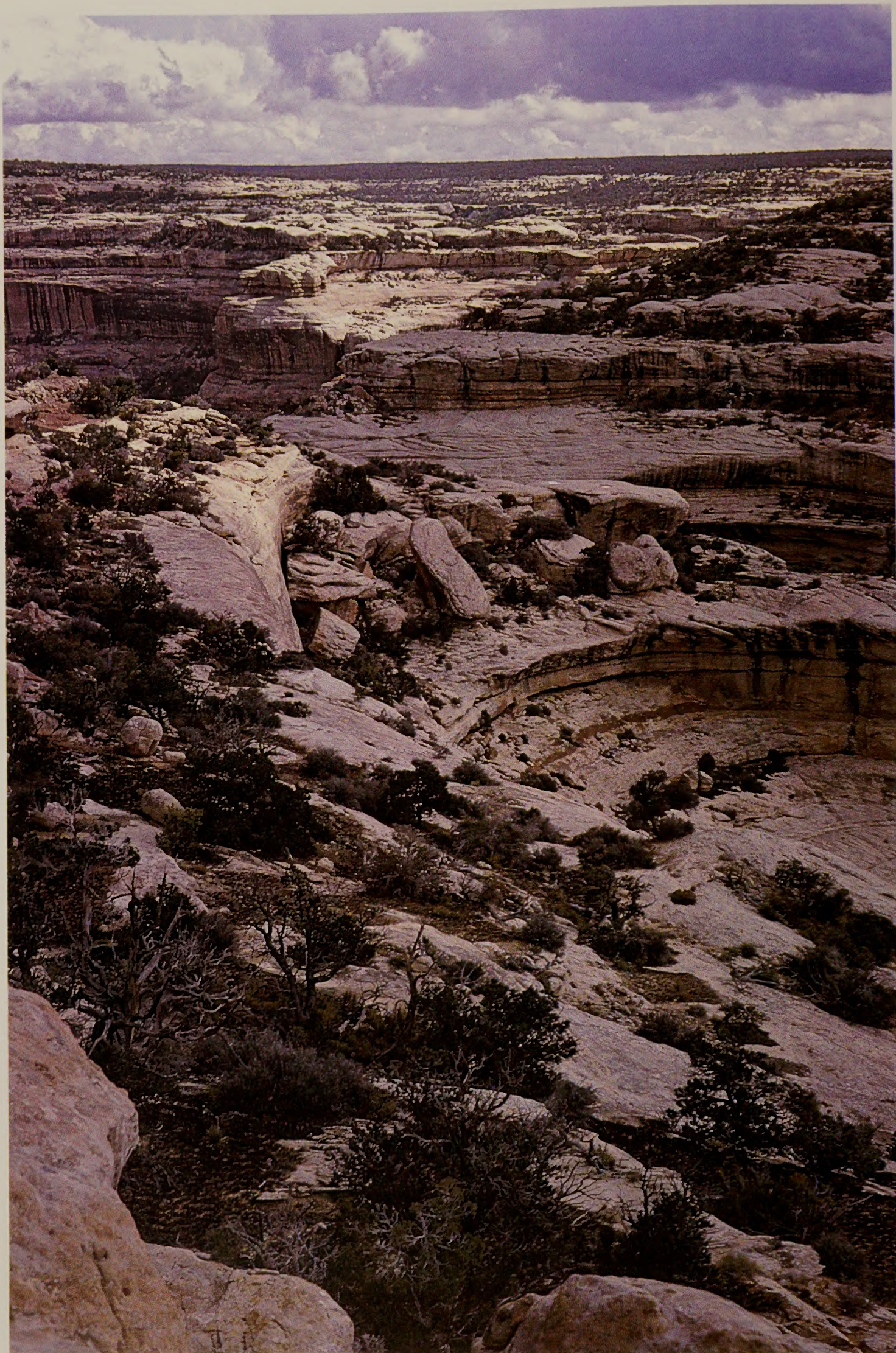
Mt. Ellen, shown in the distance, one of the two distinct topographic types found in the Mt. Ellen-Blue Hills WSA.



The badland topography with drainages carved into the mancos formation in the Blue Hills portion of the Mt. Ellen-Blue Hills WSA.



The canyons and semi-arid climate along the Dirty Devil River in the Dirty Devil WSA.



Sandstone cliffs with terraces cut into pinyon-juniper covered mesa near Turkey Pen ruin in the Grand Gulch Complex ISA.



Big Necklace Panel petroglyph up Steep Canyon in Grand Gulch ISA Complex.



A deep and meandering canyon near Owl Creek cuts through slickrock and a gently undulating mesa with pinyon-juniper in the Fish Creek Canyon WSA.



Pinyon-juniper covered plateau and steeply sloping canyon walls with side drainages in the Dark Canyon ISA Complex.



Slickrock fins characteristic of Behind the Rocks WSA.



Sandy flats in rolling sandstone terrain with deep-cut drainages and river canyon bottoms characteristic of the Horseshoe Canyon (North) WSA.



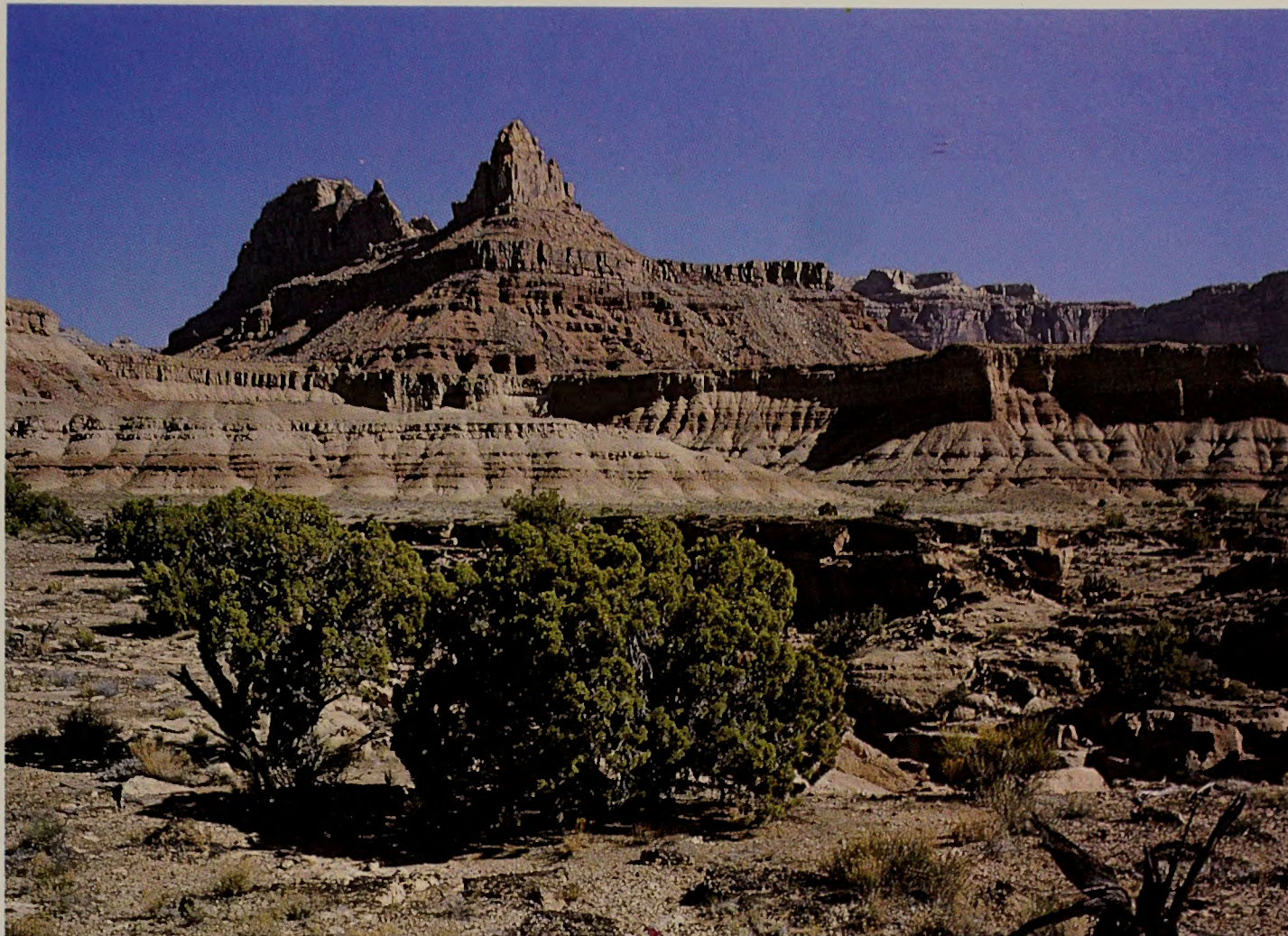
Uplifting with deep-cut drainages and rugged terrain in the San Rafael Reef WSA.



Fluted sandstone in Little Wild Horse Canyon in the Crack Canyon WSA.



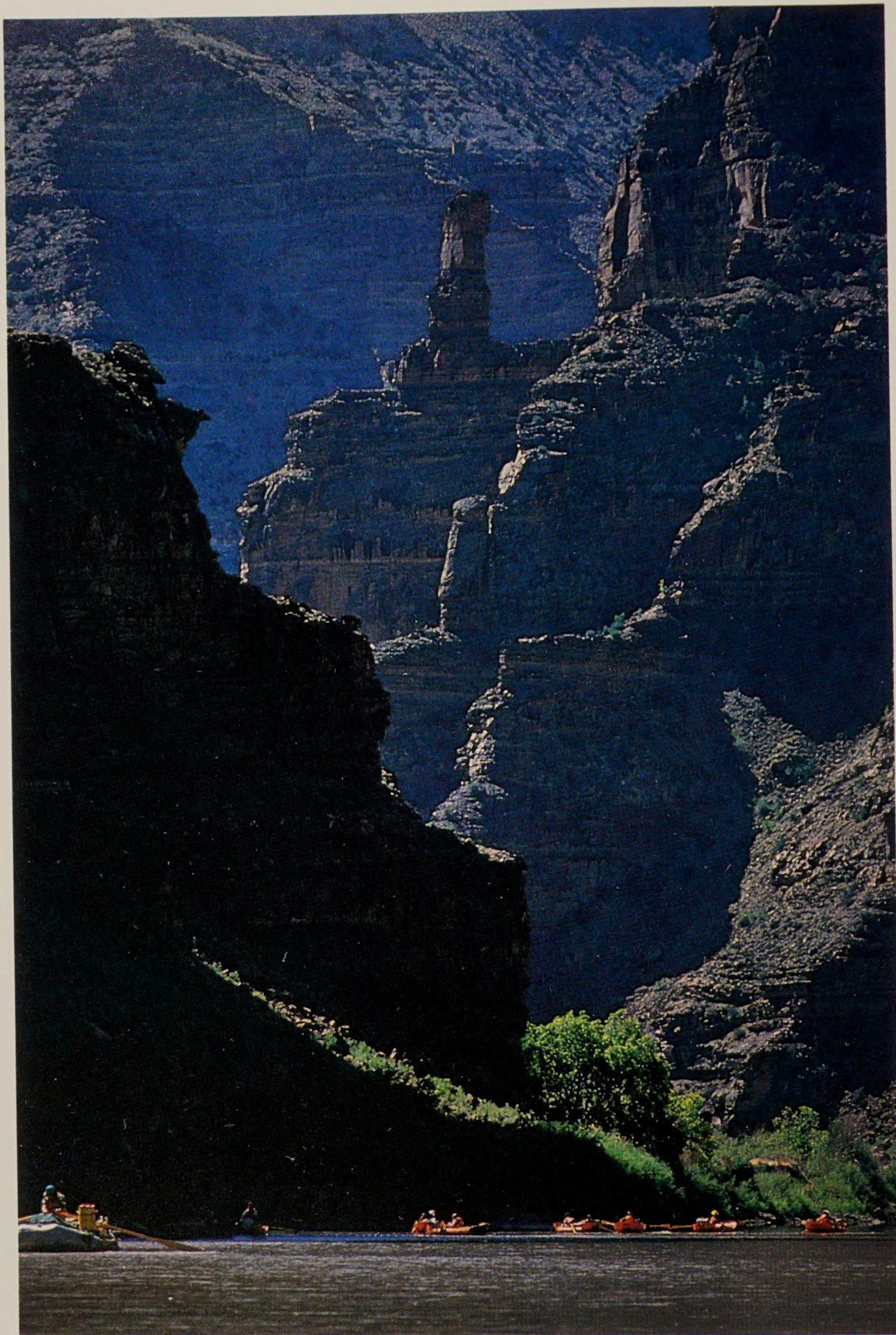
Domes perched above rolling mesas in Sid's Mountain WSA.



Large, colorful erosional remnants near the Indian Bench area in the Mexican Mountain WSA.



Price River Canyon in Desolation Canyon WSA.



© Bill Belknap Photo

The near-vertical walled canyons and Powell's Lighthouse Rock just above Jack Creek on the Green River in Desolation Canyon WSA.

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Summary



SUMMARY

Study Authority and Policies

The BLM Statewide Wilderness Study is based on the Wilderness Act, Sections 202 and 603 of the Federal Land Policy and Management Act (FLPMA), the BLM Wilderness Inventory Policy, the BLM Wilderness Study Policy, the BLM Wilderness Management Policy, and the National Environmental Policy Act (NEPA).

Alternatives Analyzed

The study is focused on 83 WSAs, including several complexes or groups, located in five regions of the State of Utah. Most BLM WSAs are located in the southern part of the State. Eighteen Statewide alternatives (combinations of WSAs) are suggested or considered, with six of these analyzed in detail. The Statewide alternatives analyzed in detail, with the exception of the No Action/No Wilderness Alternative, are displayed on Maps 1, 5, 6, 7, and 8 in the back pocket of Volume I, and are as follows:

• BLM Proposed Action

Would designate 1,975,219 acres in all or part of 66 WSAs. Includes all areas and acres currently judged by BLM to be suitable for inclusion in the National Wilderness Preservation System (NWPS).

• No Action/No Wilderness Alternative

Would designate no acres. Alternative required by NEPA. Provides lower limit of designated acreage to range of alternatives.

• Regional Representative Areas Alternative

Would designate 956,616 acres in all or part of 14 WSAs. Includes a selection of one or more WSAs that BLM believes are most representative of each of five geographic regions in the State.

• Paramount Wilderness Quality Alternative

Would designate 1,533,030 acres in all or part of 32 WSAs. Includes highest quality areas having minimum conflicts with other resources, to the extent possible; also includes key areas where wilderness values clearly exceed other resource values, if unavoidable conflicts exist.

• Cluster and Interagency Areas Concept Alternative

Would designate 2,486,732 acres in all or part of 53 WSAs. Reflects geographic distribution and includes adjacent WSAs separated by dirt or gravel roads, minor intrusions, and less than a 0.5-mile distance. Identifies clusters that total about 60,000 acres or more, including adjacent non-BLM wilderness lands or wilderness proposals.

• All Wilderness Alternative

Would designate 3,235,834 acres in 83 WSAs. Includes all acreage within all WSAs. Provides upper limit of WSA acreage to range of BLM alternatives.

Major Issues

As a result of the scoping process and public comments on the Draft Environmental Impact Statement (EIS), BLM has identified the following principle issues, which are analyzed for each Statewide alternative.

• Impacts on Wilderness Values, Including:

1. Impacts on naturalness.
2. Impacts on opportunities for solitude.
3. Impacts on opportunities for primitive and unconfined recreation.
4. Impacts on wilderness special features.

• Impacts on Water Uses

• Impacts on Mineral and Energy Exploration and Production, Including:

1. Impacts on leasable mineral exploration and production.
2. Impacts on locatable mineral exploration and production.

• Impacts on Local Economic Conditions, including:

1. Impacts on local employment.

SUMMARY

2. Impacts on local sales.

3. Impacts on Federal revenues and returns to the local economy.

Numerous other issues were raised during review of the Draft EIS; however, BLM has determined that they are not significant on a Statewide basis (see Chapter 1. Issue Identification). Other issues specific to the various WSAs are addressed in the individual WSA analyses (Volumes II through VI). Table 4 identifies the issues for each WSA.

Impact Analysis

The analysis is based on projected conditions with and without wilderness designation. Volume I provides analysis of the cumulative, Statewide effect of the few issues that have cumulative consequences due to the large number of WSAs involved. Issues not analyzed here were not cumulatively important across the State and are covered individually in the analysis of the WSAs in later volumes. Analysis for each individual WSA is provided, as well as analysis of Statewide alternatives. An issue-oriented Statewide impact summary is provided in this volume at the end of Chapter 2 (Table 22).

Purpose of the EIS

The EIS: (1) documents the environmental analysis carried out by BLM as part of the wilderness study; (2) provides information for the public; (3) provides information as part of BLM land use planning and proposed wilderness suitability recommendations; and (4) provides information for Congressional decision-making.

The purpose of the EIS is to provide an objective analysis of environmental impacts. It is not intended to resolve public controversy on need for wilderness, answer the question on how much wilderness is enough, provide a cost/benefit analysis, or be a final decision document. Although the EIS includes discussion of important topics (e.g., State land in-holdings and water), future policies and/or legal determinations outside of the EIS process may significantly affect such matters.

The EIS is written to fulfill the requirements of the National Environmental Policy Act (NEPA). It is intended to reflect public involvement, provide information, and assist in the BLM wilderness study process. BLM must report the results of the study, through the

Secretary of the Interior and the President, to Congress. Only Congress can designate wilderness areas on Federal lands.

Chapter 1

Introduction



CHAPTER 1

INTRODUCTION

INTRODUCTION

Section 603 of the FLPMA (Ninety-Fourth Congress of the U.S., 1976) requires the BLM to inventory, study, and report to Congress the opportunities for designation of public lands for inclusion in the NWPS, consistent with the Wilderness Act (Eighty-Eighth Congress of the U.S., 1964). In Utah, BLM is meeting this requirement in a comprehensive Statewide program. This is in response to requests from the former Governor of Utah and Utah Congressional Delegation. This EIS involves investigation of both individual WSAs and Statewide considerations. This approach is a BLM Category 3 amendment process as outlined in BLM Manual 1617.42C and 43 Code of Federal Regulations (CFR) 1610.5-5(b) which states that, "If several plans are being amended simultaneously, a single environmental impact statement may be prepared to cover all amendments." The Statewide Wilderness EIS is linked to the BLM land use plans through the analysis of the present plan as the No Action/No Wilderness Alternative.

Location

In Utah, BLM manages about 22 million acres of public land, located primarily in the western, southern, and eastern parts of the State. Consequently, the wilderness study focuses on these lands and these same sections of the State. As a result of the wilderness inventory process (including several public comment periods), BLM has prepared 83 WSA analyses. The WSAs are grouped into five somewhat homogeneous geographic regions.

- West-Central Region: covers Utah's West Desert.
- South-West Region: includes Zion vicinity and Kaiparowits Plateau.
- South-Central Region: includes the Henry Mountains and Dirty Devil River area.
- South-East Region: covers the Canyonlands country.
- East-Central Region: includes San Rafael Swell and the Book Cliffs.

The general location and extent of these regions in relation to the entire State of Utah are shown on Map 1.

Table 1 indicates, for each region of the State, the number of WSA analyses and the number of acres under study within each of the affected counties.

Table 1
BLM Utah WSA
Acres By Region and County

Region	Number of WSAs	County	Acres in WSA
West-Central	11	Tooele	99,150
		Juab	92,390
		Millard	265,600
		Beaver	<u>7,140</u>
		Subtotal	464,280
South-West	30	Iron	4,433
		Washington	88,501
		Lincoln (Nevada)	5,400
		Kane	639,958
		Garfield ^a	<u>288,878</u>
		Subtotal	1,027,170
South-Central	10	Garfield ^a	240,080
		Wayne ^b	<u>188,706</u>
		Subtotal	428,786
South-East	16	Wayne ^b	1,920
		San Juan	387,595
		Grand ^c	28,080
		Emery ^d	<u>18,580</u>
		Subtotal	436,175
East-Central	16	Emery ^d	428,030
		Grand ^c	319,415
		Carbon	87,020
		Uintah	<u>44,958</u>
		Subtotal	879,423
Totals	83 ^e		3,235,834

Source: WSA Analyses.

^aGarfield County total for both regions - 528,958 acres.

^bWayne County total for both regions - 190,626 acres.

^cGrand County total for both regions - 347,495 acres.

^dEmery County total for both regions - 446,610 acres.

^eWSAs that have been grouped for study, such as Grand Gulch ISA Complex, are counted as one.

Locations of individual WSAs are shown on the large fold out maps in the back pocket of this volume.

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CHAPTER 1: INTRODUCTION

Table 2 lists the names of the WSA analyses included in each region, the acreage of each WSA, and the acreage within the partial WSA designation alternatives contained in the individual WSA analyses, Volumes II through VI.

Purpose of the BLM Wilderness Study

As required by law, the purpose of the BLM wilderness study is to identify and recommend areas suitable for preservation of wilderness characteristics. The need for wilderness is stated in the Wilderness Act as follows:

"In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose, there is hereby established a National Wilderness Preservation System to be composed of Federally owned areas designated by Congress as 'wilderness areas,' and these shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness . . ."

The purpose of the BLM-proposed program is to set forth the areas on public lands in Utah that, after careful study, are to be recommended by BLM for wilderness designation by Congress as part of the NWPS. This EIS: (1) documents the environmental analysis carried out by BLM as part of the wilderness study, including analysis of alternatives; (2) provides information for use in wilderness suitability recommendations; and (3) provides required environmental information for Congressional decision-making. This EIS fulfills the various requirements of the NEPA.

WILDERNESS OVERVIEW

The Wilderness System - Background and National Perspective

The concept of leaving land areas administered by the Federal Government in a natural wilderness state emerged in the early 1920s. Initially, the idea of declaring wilderness areas was intriguing but not readily accepted. However, in 1924, the District Forester in charge of Arizona and New Mexico (today called the Regional Forester) utilized his administrative authority to classify a part of the Gila National Forest as the Nation's first wilderness area (Roth, 1988). The wilderness idea was born.

Forest Service management procedures incorporated the concept of wilderness or primitive land classification for other selected areas, resulting in the beginning of the NWPS. Additions to the system brought the acreage administratively set aside as wilderness to more than 9 million acres by the time the Wilderness Act became law in 1964 (see Figure 1). This act formalized the concepts of wilderness developed over the preceding 40 years. It gave only Congress authority to add areas to the NWPS. Congress defined wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." Wilderness is further defined as "an area of undeveloped Federal land retaining its primeval character and influence . . . and which: (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value" (Eighty-Eighth Congress of the U.S., 1964).

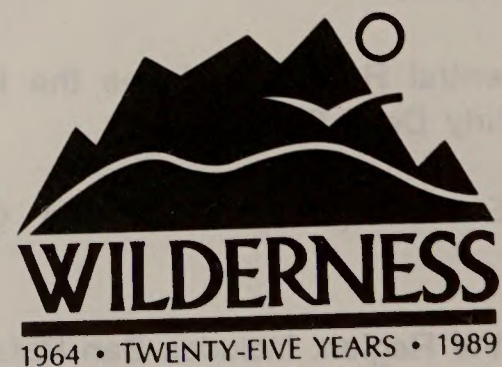
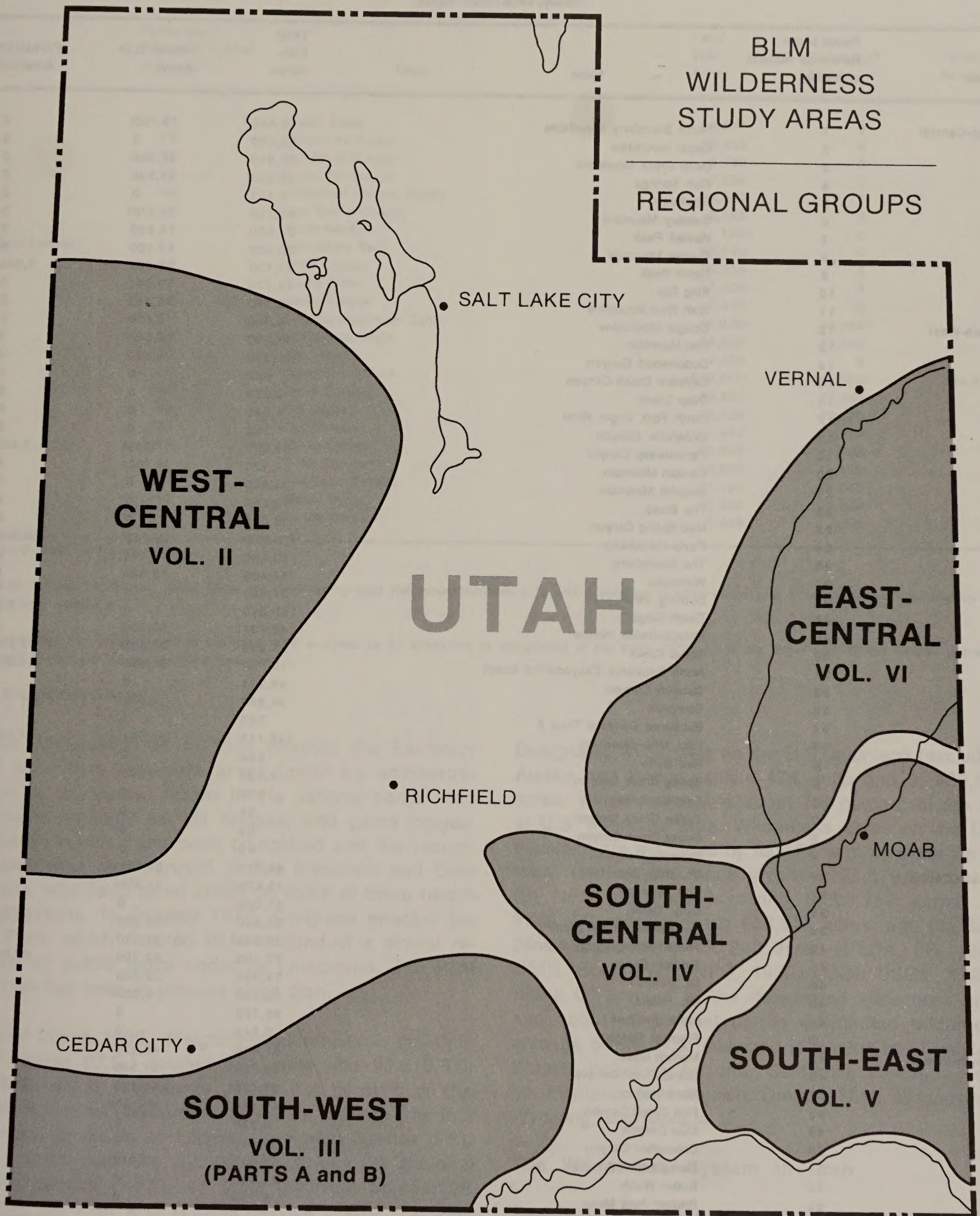


FIGURE 1

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MAP 1

CHAPTER 1: INTRODUCTION

Table 2
WSAs Within Each Region

Region	Pocket Map ^a Reference Number or Letter	Name	Total WSA Acres	Partial (L) ^b Acres	Partial(S) ^b Acres
West-Central	1	North Stansbury Mountains	10,480	8,700 ^c	0
	2	Cedar Mountains	50,500	0	0
	3	Deep Creek Mountains	68,910	57,384 ^c	0
	4	Fish Springs	52,500	33,840	0
	5	Rockwell	9,150	0	0
	6	Swasey Mountain	49,500	34,376 ^c	0
	7	Howell Peak	24,800	14,800	0
	8	Conger Mountain	20,400	14,000	0
	9	Notch Peak	51,130	28,000	9,000
	10	King Top	84,770	53,044	0
	11	Wah Wah Mountains	42,140	36,382	0
South-West	12	Cougar Mountains	15,968	6,408 ^c	0
	13	Red Mountain	18,290 ^c	12,842 ^c	0
	14	Cottonwood Canyon	11,330	9,853	0
	15	LaVerkin Creek Canyon	567	0	0
	16	Deep Creek	3,320	0	0
	17	North Fork Virgin River	1,040	0	0
	18	Orderville Canyon	1,750	0	0
	19	Parunuweap Canyon	30,800	17,888 ^c	7,400
	20	Canaan Mountain	47,170	33,800 ^c	0
	21	Moquith Mountain	14,830	0	0
	22	The Blues	19,030	0	0
	23	Mud Spring Canyon	38,075	0	0
	24	Paria-Hackberry	136,222 ^c	95,042 ^c	59,670 ^c
	25	The Cockscomb	10,080	5,100	0
	26	Wahweap	134,400	70,380	0
	27	Burning Hills	61,550	0	0
	28	Death Ridge	62,870	0	0
	29	Phipps-Death Hollow	42,731	39,256	0
	30	Steep Creek	21,896	20,806 ^c	18,350 ^c
	31	North Escalante Canyons/The Gulch	119,752 ^c	91,558 ^c	54,500
	32	Carcass Canyon	46,711	0	0
	33	Scorpion	35,884	14,978 ^c	0
	34	Escalante Canyons Tract 5	760	0	0
	35	Fifty Mile Mountain	146,143	91,361 ^c	51,540
	A	Red Butte	804	0	0
	B	Spring Creek Canyon	4,433	1,607 ^c	0
	C	The Watchman	600	0	0
	D	Taylor Creek Canyon	35	0	0
	E	Goose Creek Canyon	89	0	0
	F	Beartrap Canyon	40	0	0
South-Central	36	Mt. Ellen-Blue Hills	81,726	65,804 ^c	0
	37	Bull Mountain	13,620 ^c	11,800 ^c	0
	38	Dirty Devil	61,000	0	0
	39	Horseshoe Canyon (South)	38,800	36,000	28,700
	40	French Spring-Happy Canyon	25,000	11,110	0
	41	Fiddler Butte	73,100	32,700	27,000
	42	Mt. Pennell	74,300	25,800	0
	43	Mt. Hillers	20,000	16,360 ^c	0
	44	Little Rockies	38,700	0	0
	G	Fremont Gorge	2,540	0	0
South-East	45	Mancos Mesa	51,440	46,120	0
	46	Grand Gulch Complex	105,520	37,580	0
	47	Road Canyon	52,420	45,720	23,220
	48	Fish Creek Canyon	46,440	40,160 ^c	0
	49	Mule Canyon	5,990	0	0
	50	Cheesebox Canyon	15,410	0	0
	51	Dark Canyon Complex	68,030	62,040	0
	52	Butler Wash	24,190	0	0
	53	Bridger Jack Mesa	5,290	0	0

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Table 2 (Continued)
WSAs Within Each Region

Region	Pocket Map ^a Reference Number or Letter	Name	Total WSA Acres	Partial (L) ^b Acres	Partial(S) ^b Acres
East-Central	54	Indian Creek	6,870	0	0
	55	Behind the Rocks	12,635	0	0
	56	Mill Creek Canyon	9,780	0	0
	57	Negro Bill Canyon	7,620	0	0
	58	Horseshoe Canyon (North)	20,500	0	0
	H	Lost Spring Canyon	3,880	0	0
	J	South Needles	160 ^c	0	0
	59	San Rafael Reef	59,170	0	0
	60	Crack Canyon	25,335	0	0
	61	Muddy Creek	31,400	0	0
	62	Devils Canyon	9,610	0	0
	63	Sids Mountain/Sids Cabin	80,970 ^c	80,084 ^c	0
	64	Mexican Mountain	59,600	46,750	0
	65	Jack Canyon	7,500	0	0
	66	Desolation Canyon	290,845 ^c	224,850 ^c	144,510 ^c
	67	Turtle Canyon	33,690	27,960	0
	68	Floy Canyon	72,605	23,140	0
	69	Coal Canyon	61,430	20,774 ^c	0
	70	Spruce Canyon	20,350	14,736 ^c	0
	71	Flume Canyon	50,800	16,495 ^c	0
	72	Westwater Canyon	31,160	26,000	0
	73	Winter Ridge	42,462	28,044	0
	I	Daniels Canyon	2,496	0	0

Sources: Map 1 and Pocket Map 1.

^a List includes 83 WSAs: 73 of these are identified by Map Reference Numbers 1-73 and 9 restored to WSA status and 1 new WSA are identified by Map Reference Letters A-J.

^b Indicates acreage analyzed in individual WSA analyses as an alternative to designation of the entire WSA. (L) is the larger and (S) the smaller where two Partial Wilderness Alternatives are analyzed.

^c Changed from Draft EIS.

The Wilderness Act of 1964 directed the Secretary of Agriculture to review areas under his administration for wilderness review in the national parks, monuments, national wildlife refuges, and game ranges. These reviews have been completed and the recommendations sent forward to the President and Congress, who have taken action on some of these recommendations. In October 1976, Congress enacted the FLPMA, which directed BLM to conduct a similar review on public lands under its jurisdiction. The BLM review has been in process since then.

As of March 1989, designated wilderness in the United States (U.S.) totaled 491 units and 90,813,570 acres, which represents about 4.2 percent of the total land area. Wilderness areas are managed by four Federal agencies as follows: (1) Forest Service (FS), 354 units involving 32,532,285 acres; (2) National Park Service (NPS), 41 units involving 38,498,128 acres; (3) Fish and Wildlife Service (FWS), 71 units involving 19,332,897 acres; and (4) BLM, 25 units involving 450,260 acres (USDA, FS, 1989; and USDI, BLM, FWS, NPS 1989).

Designated wilderness on the U.S. mainland (excluding Alaska and Hawaii) totals 474 units and 39,639,880 acres, which represents about 1.6 percent of the total U.S. mainland area. Wilderness acres on the U.S. mainland are managed by four Federal agencies as follows: (1) FS, 340 units involving 27,078,949 acres; (2) NPS, 31 units involving 6,000,758 acres; (3) FWS, 50 units involving 656,577 acres; and (4) BLM, 25 units involving 450,260 acres (USDA, FS, 1989; USDI, BLM, FWS, NPS, 1989; USDI, USGS, 1987). About 66 percent of the designated wilderness units and about 82 percent of the designated wilderness acreage on the U.S. mainland is located in 11 western States; including Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, Washington, Wyoming, and Nevada.

The Wilderness System in Utah

The first wilderness area in Utah, designated by Congress in 1977, was Lone Peak in the Wasatch National Forest. In 1984, Congress added 14 other Utah National Forest areas (listed in Chapter 3),

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making approximately a total of 802,238 acres of existing wilderness land in Utah. In 1988, Congress also designated approximately 22,600 acres of BLM lands in southern Utah as wilderness in conjunction with a wilderness act for Arizona. Utah currently provides approximately 3.2 percent of the number of wilderness areas and 0.9 percent of the wilderness acreage nationwide, and approximately 3.5 percent of the wilderness areas and 2.4 percent of the wilderness acreage in the U.S. mainland. An additional 1,264,431 acres of land within eight national parks and monuments in Utah have been recommended by the NPS for wilderness designation. Although not formally identified as wilderness, two other land areas in Utah have been managed to preserve roadless, primitive values. These are a 56,800-acre block of State land in the Book Cliffs of northern Grand County and a 413,000-acre portion of the Hill Creek Extension of the Uintah and Ouray Indian Reservation. Recently, the State Land Board announced the intent to remove roadless management objectives for the Book Cliffs State land block (existing wilderness areas are discussed further in Chapter 3).

In August 1979, the initial BLM wilderness inventory was conducted in Utah. This inventory reviewed the 22 million acres of BLM-administered lands in Utah and identified lands that "clearly and obviously" did not contain wilderness characteristics and those areas that might have those characteristics, as specified in the Wilderness Act. Areas that might have wilderness characteristics were reviewed in greater depth in an intensive inventory. The inventories were conducted in accordance with the Wilderness Inventory Handbook (USDI, BLM, 1978a).

In November 1980, areas with wilderness characteristics were designated as WSAs. The decision not to identify several areas as WSAs was appealed by environmental groups to the Interior Board of Land Appeals (IBLA). IBLA remanded most of the areas back to BLM for reconsideration. BLM conducted additional field work on those areas and concluded that several areas warranted further study and identified them as WSAs. Those areas appealed but not identified as WSAs were again appealed by the same environmental groups. As a result of this second appeal, additional acreage was included in three WSAs and BLM's earlier findings on six areas were affirmed. A subsequent appeal was rejected by IBLA.

On February 3, 1982, the Wilderness Study Policy was published, which has guided the continued study of the WSAs (USDI, BLM, 1982b). There are 13 BLM-

administered areas in Utah that were previously classified as natural or primitive areas. These areas were identified as ISAs and, under Section 603 of the FLPMA, they were to be studied and wilderness suitability recommendations made to Congress by July 1, 1980. Accordingly, five ISAs (Book Cliffs, Devils Garden, Joshua Tree, Escalante Canyons Tract 1, and Link Flats) were studied and recommendations made for nondesignation as wilderness. As of June 1990, Congress has not acted on these recommendations. BLM's Utah State Office received authorization to review the other eight ISAs as part of the regular wilderness review process. These ISAs are included as part of this document. They are: Dark Canyon Complex, Grand Gulch Complex, Phipps-Death Hollow, North Escalante Canyons/The Gulch (including Escalante Canyons Tracts 2, 3, and 4), and Escalante Canyons Tract 5. For ease of presentation, they are included under the general reference of WSAs throughout this document, rather than specifically singled out as ISAs.

Fourteen selected areas originally were included in the wilderness study under the general land use planning provisions (Section 202) of FLPMA, although they did not meet the 5,000-acre size criterion. These were areas adjacent to NPS or FS-proposed wilderness areas. By decision of the Secretary of the Interior, four of these areas remained in the study and 10 were deleted. On April 18, 1985, the United States District Court for the Eastern District of California issued a decision (Civil No. 5-83-035 LKR) to return to WSA status areas of less than 5,000 acres contiguous with potential wilderness areas of other agencies. Ten of these areas that previously had been dropped from study in Utah total 18,489 acres. That decision also required inclusion of split-estate (Federal surface and State subsurface) land, totaling 805 acres, previously omitted in four WSAs in Utah. Subsequently, BLM found that one of the 10 reinstated areas (Big Hollow) now fails to qualify since it no longer is contiguous to the boundary of the designated National Forest Deseret Peak Wilderness, as revised by Congress. It has been formally deleted (Federal Register Notice dated December 18, 1987), but the other nine areas are included (as indicated by Pocket Map Reference Letters A through I). The Draft EIS identified two additional WSAs (Sids Cabin [440 acres] and South Needles [160 acres]) that were established under FLPMA Section 202. The Sids Cabin WSA resulted from acquisition of a private in-holding in the Sids Mountain WSA and the South Needles WSA resulted from a corrected ownership map for part of a section located between the Butler Wash WSA and

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Canyonlands National Park. The Final EIS includes two other Section 202 WSAs (Red Mountain 132A [40 acres] and Paria-Hackberry 247A [400 acres]) which result from exchange of private in-holdings after the original wilderness inventory. The South Needles WSA is analyzed as a separate WSA in Volume V (identified as Pocket Map Reference Letter J), while the other three new WSAs are incorporated within the acreage, maps, and analysis of the surrounding original WSAs.

The WSAs analyzed in this document include 3,235,834 acres of BLM-administered public land. About 3,230,434 acres of the WSAs are in Utah and comprise 6.15 percent of the land in Utah. In addition, there are 24,120 acres of BLM-administered lands in WSAs in Utah that are not addressed in this EIS but are being studied by BLM in the adjacent States, and 3,352 acres in ISAs that were studied prior to the Statewide Wilderness EIS. Table 3 summarizes the overall totals of land under wilderness designation, management, or study within Utah. The percentage figures shown in the table are based on a total Statewide land area of 52,541,440 acres in Utah (USDI, BLM, 1988b).

WILDERNESS CRITERIA AND STANDARDS

Inventory Criteria

The Wilderness Act lists the criteria that must be present for an area to qualify as wilderness. Each area must meet all of the criteria, as specified. The area must: (1) generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) have outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) have at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in a nonimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

These basic inventory criteria were used to define the WSAs; however, they are not the only factors involved in the study. As the study proceeds, other criteria are applied to evaluate wilderness suitability.

Study Policy and Planning Criteria

The BLM planning regulations provide for the development of planning criteria to guide the development of

Resource Management Plans (RMPs) and to provide parameters for analysis and decisionmaking. For wilderness, these regulations are supplemented by the Wilderness Study Policy. All BLM wilderness recommendations (both suitable for preservation as wilderness and unsuitable) are to be determined on the basis of the following criteria and standards.

Criterion No. 1. Evaluation of Wilderness Values:

The study addresses the extent to which each of the following components contributes to the overall value of an area for wilderness purposes.

A. Mandatory Wilderness Characteristics: size, naturalness, and outstanding opportunities for solitude or primitive recreation.

B. Special Features: ecological, geological, or other features of scientific, educational, scenic, or historical value.

Table 3
Existing and Potential Wilderness Areas in Utah

Land Administration	Acres	Percent of Land in Utah
National Forest (designated)	779,638	1.48
National Park (recommended and considered)	1,292,814 ^a	2.46
State (roadless area)	56,800 ^b	.11
Indian Tribe (roadless area)	413,000	.79
BLM (designated)	22,600 ^c	.04
BLM (study)	3,257,906 ^d	6.20
Totals	5,822,758	11.08

Source: BLM File Data; USDI, BLM 1988b.

^aCongressional legislation to designate a portion of this NPS acreage was initiated in June 1985 (H.R. 670), but not enacted.

^bRoadless area management objectives may be discontinued by the State Land Board, according to announcements made in 1989.

^cDesignated as part of the Arizona Wilderness Act.

^dIncludes 3,230,434 acres in Utah studied in the Statewide EIS, 24,120 acres being studied by BLM in adjacent states and 3,352 acres in ISAs that were studied prior to the Statewide EIS.

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C. Multiple Resource Benefits: other multiple resource values and uses that only wilderness designation of the area could ensure.

D. Diversity in the NWPS: the extent to which wilderness designation would contribute to expanding the diversity of the NWPS by:

1. Expanding the diversity of natural systems and features, such as ecosystems and landforms.
2. Identifying and preserving opportunities for solitude or primitive recreation within a 1-day travel from major population centers.
3. Balancing the geographic distribution of wilderness areas.

Criterion No. 2. Manageability: The area must be capable of being effectively managed to preserve its wilderness character. Any areas designated would be managed within the framework of the BLM Wilderness Management Policy and additional interpretation as discussed in Chapter 2 and Appendix 1 (BLM Manual 8560 and 43 CFR 8560).

In addition to the two wilderness planning criteria, a set of quality standards for analysis and documentation also has been established. The use of quality standards is intended to facilitate administrative review of BLM wilderness recommendations by providing consistency in the types of information and analysis presented in each wilderness study. The following six quality standards are to be addressed in the BLM review process for each WSA.

Standard No. 1. Energy and Mineral Resource Values: Consideration of any identified or potential energy and mineral resource values.

Standard No. 2. Impacts on Other Resources: The extent to which other resource values or uses of the area would be foregone or adversely affected as a result of wilderness designation.

Standard No. 3. Impact of Nondesignation on Wilderness Values: The alternative use of land under study if the area is not designated and wilderness values of the area that would be foregone or adversely affected as a result of this use.

Standard No. 4. Public Comment: Comments received from interested and affected publics at all levels, in conjunction with analysis of a WSA's

multiple resource and social and economic values and uses.

Standard No. 5. Local Social and Economic Effects: Attention to local adverse or favorable social and economic effects identified that could occur through wilderness designation.

Standard No. 6. Consistency With Other Plans: The extent to which designation or nondesignation would be consistent with officially approved and adopted resource-related plans of other Federal agencies, State and local governments, and Indian tribes (and the policies and programs contained in such plans) (Federal Register Notice dated February 3, 1982).

It is noted that all acreage within the 83 WSAs qualifies for study based on the inventory criteria. Additionally, as a result of the study policy and planning criteria, BLM has made a preliminary determination as to which WSAs or portions of WSAs are recommended suitable for wilderness designation. These are identified as the BLM Proposed Action in the EIS. The rationale for the Proposed Action is summarized in Appendix 11. Wilderness Study Reports that will be prepared and submitted to the Secretary of the Interior, the President, and Congress will record BLM's wilderness recommendations and rationale. Alternatives that reflect application of both the inventory criteria and the planning criteria are included in this EIS.

ISSUE IDENTIFICATION

A full program of public scoping was conducted as part of the preparation of the Draft EIS. Scoping prior to the draft is summarized in the booklet entitled Public Scoping Issues and Alternatives available on request from the BLM Utah State Office (USDI, BLM, 1984c). The general and Statewide comments used to guide the preparation of the Draft EIS are summarized and responded to in Appendix 2 and the Introductions to the individual WSA analyses in the Draft EIS.

BLM used the information obtained from scoping meetings, workshops, comments received during the public comment period, and input from BLM personnel to identify issues for analysis for each alternative analyzed in detail in the Draft and Final EISs. Significant and insignificant issues for each of the 83 WSAs are identified and addressed in the Introductions to Volumes II through VI and the individual WSA analyses. Table 4 identifies issues analyzed for each WSA in the

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Table 4
Summary of Issues for Each WSA Analysis

WSA Name	Wilderness Values	Air Quality	Geology and Topography	Vegetation Including Special Status Species	Water Resources	Mineral and Energy Resources	Wildlife Including Special Status Species	Forest Resources	Livestock and Wild Horses/Burros	Visual Resources	Cultural Resources	Recreation	Specific Land Uses	Socio-Economics
North Stansbury Mountains	X					X			X		X	X		
Cedar Mountains	X					X			X		X	X		
Deep Creek Mountains	X				X	X	X		X		X	X		X
Fish Springs	X								X				X	
Rockwell	X													
Swasey Mountains	X					X	X					X		X
Howell Peak	X								X					
Conger Mountain	X					X			X				X	
Notch Peak	X								X			X		
King Top	X								X			X		
Wah Wah Mountains	X								X					
Cougar Canyon	X						X		X					
Red Mountain	X								X					X
Cottonwood Canyon	X				X	X			X					
LaVerkin Creek	X													
Deep Creek	X				X									
North Fork Virgin River	X				X									
Orderville Canyon	X													
Parunuweap Canyon	X			X	X		X		X		X	X		
Canaan Mountain	X			X	X				X					X
Moquith Mountain	X			X	X				X					
The Blues	X			X		X	X		X					
Mud Spring Canyon	X			X		X	X		X					X
Paria-Hackberry	X			X	X		X		X		X	X		
The Cockscomb	X			X	X									
Wahweap	X			X		X	X		X					X
Burning Hills	X			X		X	X		X					X
Death Ridge	X			X		X	X		X					X

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Table 4 (continued)
Summary of Issues for Each WSA Analysis

WSA Name	Wilderness Values	Geology and Topography	Air Quality	Vegetation Including Special Status Species	Water Resources	Mineral and Energy Resources	Wildlife Including Special Status Species	Forest Resources	Livestock and Wild Horses/Burros	Visual Resources	Cultural Resources	Recreation	Specific Land Uses	Socio-Economics
Phipps-Death Hollow	X				X	X				X		X	X	X
Steep Creek	X				X	X	X							
North Escalante Canyons/The Gulch	X			X	X	X					X			
Carcass Canyon	X			X		X	X		X		X			X
Scorpion	X													
Escalante Canyon Tract 5	X			X		X	X		X		X			X
Fifty Mile Mountain	X			X		X	X		X		X			X
Mt. Ellen-Blue Hills	X	X		X	X		X	X	X	X				X
Bull Mountain	X			X			X		X	X				
Dirty Devil	X				X	X			X					X
Horseshoe Canyon (South)	X					X			X					
French Spring-Happy Canyon		X			X	X	X		X		X	X	X	X
Fiddler Butte	X	X		X	X	X	X		X		X	X	X	X
Mt. Pennell	X			X		X	X		X	X	X	X	X	X
Mt. Hillers	X			X	X	X	X			X	X	X	X	X
Little Rockies	X					X	X							X
Mancos Mesa	X					X	X				X			X
Grand Gulch	X					X	X				X	X		
Road Canyon	X			X		X	X		X		X	X		
Fish Creek Canyon	X			X		X	X		X		X	X		X
Mule Canyon	X					X					X			
Cheesebox Canyon	X													
Dark Canyon	X													
Butler Wash	X													
Bridger Jack Mesa	X													
Indian Creek	X													
Behind The Rocks	X			X		X	X			X	X	X	X	X
Mill Creek Canyon	X					X								X
Negro Bill Canyon	X			X		X	X							

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Table 4 (Continued)
Summary of Issues for Each WSA Analysis

WSA Name	Wilderness Values	Air Quality	Geology and Topography	Vegetation Including Special Status Species	Mineral and Energy Resources	Wildlife Including Special Status Species	Forest Resources	Livestock and Wild Horses/Burros	Visual Resources	Cultural Resources	Recreation	Specific Land Uses	Socio-Economics
Horseshoe Canyon (North)	X			X						X			X
San Rafael Reef	X			X		X			X	X	X		X
Crack Canyon	X			X		X				X			X
Muddy Creek	X			X	X	X							X
Devils Canyon	X			X		X				X			
Sids Mountain	X			X	X	X		X		X			X
Mexican Mountain	X			X	X	X		X		X			X
Jack Canyon	X			X		X				X			X
Desolation Canyon	X		X	X		X			X		X		X
Turtle Canyon	X					X							X
Floy Canyon	X			X		X		X					X
Coal Canyon	X			X		X		X					X
Spruce Canyon	X			X		X		X					X
Flume Canyon	X			X		X		X					X
Westwater Canyon	X			X		X		X					X
Winter Ridge	X			X		X		X			X		X
Red Butte	X		X							X	X		X
Spring Creek Canyon	X				X								
The Watchman	X												
Taylor Creek Canyon	X												
Goose Creek Canyon	X												
Beartrap Canyon	X												
Fremont Gorge	X												
Lost Spring Canyon	X												
Daniels Canyon	X												
South Needles	X												

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individual analyses for the Final EIS. Issues relative to the Statewide overview are addressed below. In determining the significance of issues, BLM considered the nature and magnitude of potential impacts, resources covered by law, requirements of BLM's wilderness review guidelines, and the level of public interest or concern over the potential impacts. All concerns raised in scoping were considered in the formulation of the issues and alternatives presented in this Final EIS (see Volume VII-B and VII-C, Comments and Responses). Many comments dealt with significant issues and these are analyzed for all alternatives. Other comments, concerns, and suggestions were not used because they were not consistent with laws, regulations, or policies; were based on incorrect perceptions of the purpose of wilderness and activities allowed in wilderness areas; or were based on inaccurate resource data or misunderstandings of the location and nature of the features and resources of the WSAs.

Issues Considered But Not Analyzed In Detail For Each Alternative

Many of the public comments were general in nature and dealt with the following topics:

- The purpose and need for wilderness and the role of wilderness in the multiple-use concept.
- Study procedures and biases.
- Inventory procedures and errors.
- The definition and identification of roads.
- Interim management and activities and violations.
- The need for or affect of buffer zones around wilderness.
- Relationship of wilderness to State and private land in-holdings.
- Rationale for BLM Proposed Actions.

Issues related to the purpose and need for wilderness and the overall wilderness program and study process do not relate to the alternatives or the adequacy and accuracy of the Draft EIS and are not analyzed in detail in the Final EIS. However, comments on these issues are responded to in Appendix 2 of the Draft EIS and Volume VII-B of the Final EIS.

The following additional issues are not addressed by alternative in the Statewide analysis because they are the same for all alternatives and for the other reasons described below.

• Impacts on Human Health and Safety

Local law enforcement officials expressed concern that wilderness would hamper search and rescue efforts or attract more people to remote areas and thus increase the need for and cost of search and rescue efforts.

The main hazards to human health and safety are the remote rugged conditions and inaccessibility of the WSAs. Many of the access roads bordering WSAs are infrequently traveled. As with any remote, undeveloped area, natural hazards exist, such as cliffs, poisonous snakes, and biting insects. Accidents or medical problems may be compounded by the distance from population centers where emergency help is available.

Summer rainstorms could bring flash floods and lightning strikes. However, at other times the lack of water also could be a problem. Due to lack of water, exposed rock surfaces, rough terrain, and temperature extremes, exposure could be a health hazard both during the winter and summer months.

However, wilderness designation would not generate any unusual or significant health or safety problems not already present or normally expected when considering risks and hazards innate to any wild country. This is understood and, in fact, expected or anticipated by visitors looking for an unstructured, unregulated, primitive and unconfined recreational experience. The Wilderness Management Policy acknowledges that visitor use involves risk (BLM Manual 8560). The policy states that "...visitor use in wilderness involves certain risks to the visitor as a consequence of isolation from the convenience of a technological world. The visitor must accept these risks in entering a wilderness area. In emergencies involving health and safety of persons within the area, BLM managers will take appropriate measures, such as search and rescue operations."

Visitor use facilities may be installed if they are the minimum necessary for the health and safety of wilderness visitors. Tools, equipment, or structures may also be used when necessary in emergency situations for the health and safety of the visitor.

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Current research does not indicate that wilderness designation will result in visitation significantly greater than will occur in the future without wilderness designation (McCool, 1985; and see General Comment Response 2.1). Because similar safety and health considerations would be involved with all of the alternatives and special tools and equipment may be used in emergency situations, wilderness designation would not significantly affect the ability of officials and agencies to conduct emergency search and rescue operations in wilderness areas. Impacts on human health and safety are not considered a significant issue for analysis in the Final EIS.

- Impacts on Noxious Weed and Pest Control

Local officials have expressed concern that wilderness designation would prevent effective control of noxious weeds and lead to noxious weed infestations with loss of livestock forage and other resources.

The BLM program for noxious weed control in Utah results in about 25 to 2,000 acres of public land (Statewide) treated annually. Target weed species include Russian knapweed, diffuse knapweed, musk thistle, Scotch thistle, and Canadian thistle. Herbicides are applied with vehicle-mounted and/or backpack spray equipment. Treatment has been discontinued for halogeton.

Since the noxious weed program is relatively minor and has involved primarily valley and road-side locations in the past, wilderness designation would not have substantial effects. Little, if any, treatment for noxious weeds in WSAs has occurred in the past. Canadian thistle may occur in WSAs with riparian areas and in some locations, other species of noxious weeds also may be present. Selective control could be accomplished by biological means, grubbing, or with backpack spray equipment if noxious weed problems should require treatment in wilderness areas. Emphasis would be placed on control methods that would ensure minimum disturbance to the wilderness resource and visitors.

Statewide BLM weed control efforts in remote locations are of small magnitude and would not change or be significantly different with the various alternatives. Therefore, weed control is not analyzed for each alternative.

Control of noxious weeds and potential problems are addressed for the Rockwell WSA where there is a known potential for a noxious weed invasion.

Grasshoppers and Mormon crickets on public lands are the species targeted in most BLM use of pesticides. Special care is taken when using chemicals or other artificial methods to control insects and disease. Except during occasional problem years such as 1985, grasshopper control is a small program. Very little, if any, pesticide use has occurred in WSAs in the past. Because the limited use of pesticides would be the same with all alternatives, this topic is not analyzed in detail.

- Impacts on Fire Control

Commentors were concerned that wilderness management would allow wildfires to burn and potentially destroy areas or structures outside of the wilderness areas. According to the Wilderness Management Guidelines, all fires will be controlled to prevent loss of human life or property within wilderness areas or to prevent the spread of fire to areas outside the wilderness where life, resources, or property may be threatened. The policy is clearly described and would be similarly applied for all alternatives. Therefore, the impact on fire control is not a significant issue for analysis in the Final EIS.

- Impacts on Airshed Classification and Air Quality

- Airshed Classification

The public has expressed concern that wilderness designation could lead to redesignation of WSAs from the existing Prevention of Significant Deterioration (PSD) Class II status to the more stringent Class I rating (see Volume VII-B, Section 10), because a PSD Class I classification for certain WSAs could lead to future restrictions on industrial developments in Utah. Since the BLM Wilderness Management Policy (BLM Manual 8560) states that BLM will manage all wilderness areas to comply with the existing air quality classification, wilderness designation or nondesignation would not cause the air quality classification of wilderness areas to change. The decision to change air quality classification is the prerogative of the State of Utah, rather than BLM. In addition, many of the BLM WSAs in southern Utah are adjacent to existing PSD Class I areas and would not add appreciably to present restrictions on industrial development even if PSD Class I standards were applied. Wilderness designation would not lead to further restrictions on industrial development due to establishment of additional PSD Class I areas. Therefore, the impact of

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wilderness designation on airshed classification and potential secondary affects on industrial development are not analyzed for the Statewide alternatives in this Final EIS.

- Air Quality

Commentors noted that without wilderness designation, developments and projects in the WSAs would go forward and would reduce air quality, particularly in the vicinity of PSD Class I areas.

On a Statewide basis, a maximum surface disturbance of 58,968 acres (see Table 16 and Appendix 10) is projected to occur within WSAs with implementation of the No Action/No Wilderness Alternative. The projected disturbance is 0.1 percent of Utah and would be in scattered locations and would not occur at one point in time. Reclamation of disturbed areas would be required. Disturbance in scattered locations at different times would result in temporary increases in fugitive dust emissions in isolated locations, but would not be large enough to alter air quality Statewide.

With a variance to existing air quality standards, projected tar sand development in two WSAs in the vicinity of Canyonlands National Park could lead to emissions that would exceed the PSD Class I standards in the park, but this would not affect air quality Statewide. No other major sources of air pollution are projected to occur within WSAs in the foreseeable future. Therefore, impacts on air quality are not significant Statewide issues, relative to potential activities in WSAs.

- Impacts on Geology and Topography

Commentors expressed concern that only wilderness designation can adequately protect geologic and topographic features. Potential future actions that may affect these features with the No Action/No Wilderness Alternative are subsidence and fracturing related to underground coal mining in seven WSAs in the Kaiparowits coal field and the Desolation Canyon WSA, in-situ extraction of bitumen from tar sand in two WSAs in the Tar Sand Triangle, destruction of surface features by open-pit mining of tar sand in one WSA on the Book Cliffs, and surface mining for disseminated gold in one WSA in the West Desert. Such impacts are addressed in the individual WSA analyses, but are not addressed on a Statewide basis because there would not be a noticeable Statewide affect with any of the alternatives analyzed.

- Impacts on Soils

Commentors expressed concern that without wilderness designation, mineral-related developments, land and vegetation treatments, road construction, or ORV use would occur on fragile desert soils that are not easily reclaimed. Such developments could lead to loss of soil fertility, including destruction of cryptogamic crusts, unacceptable increases in soil erosion, and secondary impacts on water quality (including increased sedimentation and increased levels of salinity in streams and major river systems).

Only 6.2 percent of Utah is within the BLM WSAs. Within the WSAs, a maximum of 58,968 acres of soil disturbance (about 2 percent of the WSA acreage) would be disturbed by anticipated projects in the foreseeable future (see Table 16 and Appendix 10). Terrain limits the use of vehicles to existing roads and ways in 52 of the WSAs. Soil loss and erosion would have localized impacts, as described in the individual WSA analyses. Not all disturbance would occur at one time, and soils would be reclaimed to the extent possible. Twenty-seven of the 62 WSAs where disturbance is anticipated have no perennial streams. Given the projected maximum of 58,968 acres of disturbance, maximum soil loss (natural and human-caused) from the WSAs is estimated to increase by only 5 percent from the present 2,939,760 tons per year to approximately 3,085,107 tons per year, while salt production from the WSAs would increase by about 7 percent from the present 80,922 tons per year to 86,375.3 tons per year. Such maximum levels are not expected due to the intermittent and widespread timing of the disturbance. Therefore, there would be few secondary impacts on water quality. For these reasons, impacts on soils and soil erosion in WSAs are not significant issues on a Statewide basis.

- Impacts on Vegetation Including Special Status Species

Commentors have expressed concern that without wilderness designation future development and activities would destroy natural vegetation characteristics and imperil endangered, threatened, and other special status plant species. Some are of the opinion that the failure to identify vegetation as a major Statewide issue shows a bias against natural values and inconsistency in the selection of issues.

It is recognized that wilderness designation would reduce the potential for project-related disturbance of vegetation types and inadvertent destruction of

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special status plant species. Nevertheless, even implementation of the No Action/No Wilderness Alternative with a maximum projected surface disturbance of 58,968 acres (2 percent of the acreage in WSAs) would modify only small portions of existing and potential vegetation types by direct removal in some localized areas. Reclamation of disturbed areas would be required by BLM. Impacts on vegetation are described in the individual WSA analyses, but would not result in an overall deterioration of any major vegetation types on a Statewide basis.

Known or projected habitat for listed endangered, threatened, or Category 1 or 2 candidate plant species could occur in 71 of the 83 WSAs. With any alternative, BLM (in compliance with the Endangered Species Act) would require site-specific clearances of potentially disturbed areas and consult with FWS concerning impacts on endangered or threatened plant species. Other specific management actions that would be taken by BLM include preparation and implementation of Habitat Management Plans, monitoring and inventory actions, fencing, ORV closures, avoidance of sensitive areas, etc. Because the necessary measures would be taken to protect these species, implementation of any of the Statewide alternatives would not adversely affect the continued existence of any special status plant species. Therefore, impacts on vegetation are not analyzed in detail for the Statewide alternatives in the Final EIS. Potential impacts on special vegetation types and plant species are identified as impacts on wilderness special features in the wilderness values analyses.

• Impacts on Water Rights

In November 1985, U.S. District Court Judge John Kane ruled (*Sierra Club vs. Block*) that Federal wilderness in Colorado carries an implicit water right. The public is concerned that wilderness designation would interfere with development of existing water rights and would establish Federal reserved water rights that would conflict with future filings, transfers, or changes in points of diversion for water use. After study of the issue by the Interior Department Solicitor, the Secretary of the Interior asked the U.S. Attorney General's Office for concurrence with the Solicitor's opinion. On July 28, 1988, the Attorney General concluded that no legally sufficient basis exists for an implication of Federal reserved water rights for wilderness purposes (Meese, 1988). Therefore, impacts on water rights is not considered a significant issue for analysis in the EIS.

• Impacts on Water Quality

Commentors were concerned that without wilderness designation, mineral, energy, other developments, livestock grazing, and ORV use would not comply with anti-degradation requirements and lead to reductions in surface water quality and, eventually, increases in salinity in the Colorado River. Some are concerned that wilderness would prevent projects designed to reduce salinity in the Colorado River.

Livestock grazing is allowed within wilderness areas and would not be eliminated by wilderness designation. Therefore, there would be little or no difference in the impacts on water quality from livestock grazing with any of the Statewide alternatives.

The BLM WSAs comprise only 3.7 percent of the upper Colorado River Basin and 0.2 percent of the lower Colorado River Basin. Projected disturbance inside the WSAs would affect much less than 0.1 percent of either basin. About 29 percent of the WSA acreage has moderate to highly saline soils. Of the 72 WSAs in the Colorado River drainage, 30 lack perennial streams. Significant effects on soil erosion and secondary impacts on water quality are not anticipated for the reasons explained above for impacts on soils.

There are no salinity control projects planned inside the BLM WSAs. Therefore, wilderness designation or nondesignation would not lead to significant increases or decreases in water quality or Colorado River salinity.

• Impacts on Salable Mineral Production

Commentors expressed concern that wilderness designation would eliminate potential for exploration and recovery of significant salable mineral resources from the WSAs. Because of lack of materials, lack of access, and the availability of salable minerals (gravel, building stones, etc.) in areas outside the WSAs, impacts on salable mineral production is not considered a significant issue for analysis in this Final EIS.

• Impacts on the Kaiparowits Plateau Energy Transportation Corridors

Concern has been expressed that wilderness designation would preclude the use of potential energy transportation corridors identified for the Kaiparowits Plateau. The only alternative that would preclude the use of these corridors would be the All Wilderness Alternative. BLM believes that implementation of this

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alternative would essentially preclude development of energy resources, mostly coal, on the Plateau. Therefore, the need to use the corridor system would be eliminated. The implementation of any of the other Statewide alternatives, would allow for the removal of energy resources using selected areas within the corridors. These potential routes could be located in such a manner as to avoid designated wilderness areas. Implementation of the No Aciton/No Wilderness Alternative would not have an affect on the transportation corridors. The environmental impacts associated with potential development of these corridors is analyzed in the Kaiparowits Coal Development and Transportation Study (ERT, 1980). In those instances where specific routes have been proposed, they are noted in the individual WSA analyses in Volumes III-A and III-B.

- Impacts on Wildlife Habitat and Populations Including Special Status Species

Commentors expressed concern that BLM had ignored the benefits of wilderness management for protection of wildlife habitat and diversity of wildlife species. Conversely, concern also was expressed that various project developments, habitat developments, and other actions for wildlife that modify the natural character of the WSAs were not adequately analyzed with respect to potential Statewide impacts. Some commentors were of the opinion that wilderness designation would protect wildlife, while others noted that wildlife thrive because of man-made and maintained habitat treatments and water developments.

Because the WSAs comprise only 3.2 out of 52.5 million acres (6.2 percent) of Utah, it is unlikely that there would be a significant Statewide affect on wildlife habitat and populations with any of the Statewide alternatives analyzed in detail. Localized disturbance to wildlife or tradeoffs in opportunities for habitat improvements in WSAs are analyzed where appropriate in the individual WSA analyses in Volumes II through VI.

Wilderness management can benefit isolation dependent species and species associated with climax vegetation types. Impacts on wilderness-dependent and special status wildlife species are addressed as impacts to wilderness special features in the wilderness values analyses of this Final EIS.

- Impacts on Livestock Grazing Levels and Management Practices

Commentors have expressed concern that the Draft EIS underestimated the effect of wilderness designation on livestock grazing. They believe that wilderness designation would eventually eliminate livestock grazing from the wilderness areas through unrealistic restrictions on maintenance practices, restrictions on access for movement and care of livestock, restrictions on the development of water, and prevention of future rangeland developments to increase livestock forage production. The concern also was raised that restrictions on predator control would increase livestock losses to predators and would force some operators out of business.

Approximately 339 livestock operators make use of an estimated 95,345 Animal Unit Months (AUMs) of livestock forage in the BLM WSAs. This amounts to 19 percent of the BLM permittees in the State, 3 percent of the total number of livestock operators in Utah, 5 percent of the livestock forage allocation on BLM-administered lands, and 1 percent of the estimated annual livestock forage use in the State (UDA, 1989).

Section 4(d)(4)(2) of the Wilderness Act of 1964 and Section 603(c) of the Federal Land Policy and Management Act of 1976 both provide for continued livestock grazing where grazing is established prior to designating wilderness. Any adjustments in grazing levels would be made through standard BLM rangeland management procedures, not as a condition of wilderness management. The acts provide for emergency use of motorized equipment for management of livestock and continuation of use that is established prior to wilderness designation. Some restrictions would be placed on the methods and frequency of access, but these would be a matter of minor inconvenience for the permittees involved. Forest Service records, which include the State of Utah, show that between 1980 and 1986, there were no decreases in permitted livestock in FS wilderness areas in the region due to wilderness management (Hall, 1987). Based on these conditions, impacts on existing livestock grazing levels and management are not considered significant Statewide issues for the Final EIS. Likewise, future potential increases of up to 3,408 AUMs in WSAs would not be significant on a Statewide basis.

During the 1986-1987 period, predator control was conducted in grazing allotments that comprise portions of 16 of the 83 BLM WSAs. Predators removed

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from these allotments (including lands inside and outside of the WSAs) were 523 coyotes, eight foxes, and one bobcat. Seventy-eight percent of the coyotes were taken by means of fixed wing aircraft or cyanide guns (USDA, APHIS, 1988). However, only a portion of these predators were actually taken inside the WSAs. Sheep and lamb losses in the affected allotments totaled approximately 262 animals (during the 1986-1987 period), or about 0.5 percent of the total Statewide sheep and lamb losses to predators reported (USDA, APHIS, 1988; UDA, 1989). Since predator control and losses to predators in WSAs are small compared to Statewide totals and since several methods of predator control would still be available following wilderness designation, impacts on predator control and livestock losses to predators are not considered a significant issue for Statewide analysis by alternative.

The issues of impacts on livestock grazing levels and management, including predator control, are addressed in the individual WSA analyses where applicable. The potential for vegetation treatments and changes in livestock forage production are reflected in the sections dealing with impacts on local economic conditions for each Statewide alternative.

• Impacts on Forest Resources

Although 2,667,263 acres in the WSAs are open to woodland harvest, the WSAs are not suitable for the production of commercial forest products due to absence or sparseness of trees, small size of trees, low growth rates, lack of access, steep terrain, and distance to market areas. In addition, a total of 568,571 acres in WSAs are closed to woodland harvest by current BLM land use plans. There is a potential for limited harvest and firewood for personal use occurs in some WSAs, but many alternative areas may be used outside of WSAs. Therefore, there would not be significant impacts on forest resources on a Statewide basis with any of the alternatives analyzed.

The Navajo tribe has expressed concern that wilderness designation in the Cedar Mesa area of southeastern Utah (EIS Volume V) would limit opportunities for firewood gathering for the tribe. The potential for this impact is addressed in the individual WSA analyses for the Cedar Mesa WSA, but this is not considered to be a Statewide issue.

• Impacts on Visual Resources

Commentors expressed concern that the Draft EIS did not recognize that wilderness designation will protect scenic values and limit disturbing activities. Future surface disturbance could have a negative impact on the visual character of some WSAs, but the regional or Statewide impact would be minimal due to the small acreage of projected disturbance (2 percent) of the WSA acreage. Degradation would occur mostly in localized areas during periods of activities and mitigation measures would be applied to minimize visual contrast. Even with the No Action/No Wilderness Alternative, the potential for surface disturbance would be low on 834,706 acres (26 percent of WSA acres) by continuation of oil and gas Category 3 or Category 4 designations, which receive no surface occupancy or no leasing, and by ORV closures or restrictions on 1,079,676 WSA acres (33 percent of WSA acres), and in many other places with rugged terrain.

Impacts to high quality scenery and the effects of Visual Resource Management (VRM) have been analyzed in the following manner:

1. The BLM VRM classes applied with each alternative are identified as management actions in the description of each alternative. The effect that VRM classes and management would have on wilderness values is discussed in the environmental consequences sections for naturalness, opportunities for solitude, opportunities for primitive and unconfined recreation, and special features.

2. High quality (VRM Class A) scenery is considered a wilderness special feature. Therefore, the effect that management would have on protection or disturbance of high quality scenery areas is addressed in the Wilderness Values, Special Features section for each alternative.

• Impacts on Cultural Resources

Some commentors were of the opinion that wilderness designation would protect cultural resources from vandalism, while others were of the opinion that wilderness designation would result in increased vandalism because wilderness management would limit management and surveillance of cultural resources while attracting additional visitation. Some indicated that the Final EIS should analyze the effects of new roads and ORV corridors in areas not designated wilderness, special problems caused by population influx-

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es associated with energy or mining projects, limited enforcement capability, and the effects these would have on cultural resources for each alternative.

BLM recognizes that disturbance by mineral and energy exploration and development with any alternative could inadvertently destroy unknown sites. There are at least 48,000 recorded cultural resource sites in the State of Utah. Approximately 5 percent (2,256 sites) of these are in BLM WSAs. Many other unrecorded sites also exist. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance in WSAs and would minimize impacts. The overall Statewide effect on cultural resources would be low due to mitigating measures that would be taken prior to surface-disturbing activities, regardless of alternative. Vandalism of sites would be expected to increase in proportion to the general population increase, and law enforcement would continue to be difficult regardless of wilderness designation. However, the benefits of additional protection against inadvertent disturbance afforded to designated areas by wilderness management would outweigh any negative effects from potential vandalism problems caused by primitive recreational activity, and the overall impact would be positive. This would apply to all Statewide alternatives, except for No Action/No Wilderness.

Therefore, cultural resources are not analyzed for each Statewide alternative. The number of known cultural resources that would be in areas designated as wilderness is reported in the analysis of impacts on wilderness special features for each of the alternatives analyzed in detail.

- Impacts on Developed and Mechanized Recreation

Some commentors were of the opinion that developed recreation, including campgrounds and roads, is of more economic value than primitive recreation. The impact on developed recreation facilities is not analyzed because such areas generally do not meet WSA criteria and are outside of WSAs; although two developed campgrounds and one community recreational development inadvertently are inside WSA boundaries. Major recreation access and scenic roads are cherry-stemmed out of WSAs or border WSAs and would not be affected by wilderness designation. The existing and proposed recreational developments are addressed in the individual WSA analyses, but impacts on developed recreation are not considered significant Statewide issues.

Several commentors were concerned that opportunities for off-road vehicle (ORV) use and access by the handicapped would be restricted by wilderness designation. The potential impact of wilderness designation upon current and potential opportunities for motorized recreation was carefully considered. For the most part, the WSAs contain rugged topography that naturally restricts ORV use and access by the handicapped, regardless of wilderness consideration.

The 1980 State Comprehensive Outdoor Recreation Plan (SCORP) reported a total of 32,260 miles of ORV trails within Utah and 17,472 miles within the three multi-county planning units in southern Utah (UDNRE, ORA, 1980). Together, the WSAs (which generally occur within these three multi-county units) contain a total of about 601.8 miles of vehicle ways (used by ORVs) or about 4 percent of the total mileage in the three multi-county regions. The WSAs contain about 2 percent of the State total of ORV trails. Portions of six WSAs (Moquith Mountain, Cedar Mountain, Crack Canyon, Devils Canyon, Sids Mountain, and Behind the Rocks) are the most popular areas for ORV use. Traditionally, ORV recreation use has followed mineral search routes into new areas. Mineral-related disturbance is projected for 47 WSAs in the foreseeable future. However, the total miles of ORV routes within WSA boundaries would remain small when compared to the total miles within southern Utah and the State as a whole. Therefore, impacts upon motorized recreation use are not considered significant on a Statewide basis and have not been analyzed for each Statewide alternative.

Impacts on motorized recreation within specific WSAs are considered in the individual analyses (Volumes II through VI). Impacts on primitive recreation (wilderness values) resulting from ORV activities are discussed on a Statewide basis for each of the alternatives analyzed in detail.

- Impacts on Land Use Plans and Controls

Issues and concerns were expressed by commentors regarding the consistency of wilderness designation with the plans and policies of BLM, other Federal agencies, and State and local governments.

The relationship of wilderness designation to other Federal agency plans, and State, County, and community land use plans and policies, displays conflict between these planning systems. Generally, wilderness designation of BLM-administered WSA lands would be consistent or compatible with plans for adjacent

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Federal lands of other agencies (NPS and FS), but in most instances would not be consistent with plans or policies of State and local agencies. State and local plans and policies are explained in the Description of the Affected Environment sections of the EIS, but their inconsistency with wilderness designation is not repetitively analyzed for each Statewide alternative. Unless State and local plans or policies change substantially, this conflict can be resolved only at the national level, thus repetitive detailed analysis of the same issue over and over again is not attempted in the Final EIS. Consistency with State and local plans would vary by Statewide alternative to the extent that more or less acreage would be designated as wilderness, as shown in Tables 5 and 6.

Table 5
Wilderness Acreage and Percent of
Utah by Alternative

Alternative	Wilderness Acres to be Designated	Percent of Land in Utah	Percent of BLM Land in Utah
Proposed Action	1,975,219	3.8	9.0
No Action	0	0	0
Regional Representative Areas	956,616	1.8	4.3
Paramount Wilderness	1,533,030	2.9	7.0
Interagency and Cluster	2,486,732	4.7	11.3
All Wilderness	3,235,834	6.2	14.7

Source: USDI, BLM, 1988b.

Although the extent of conflict would vary by acreage, the same conflicts and concerns would occur for each of the alternatives that would designate wilderness. The issue, thus, was dropped from further analysis.

• Impacts on Management and Use of State and Private In-holdings

Throughout much of the BLM-managed land in Utah, the State owns four isolated sections (generally Sections 2, 16, 32, and 36) in each township. These lands and other trust lands are administered by the Utah Division of State Lands for the purpose of economic gain in support of the State public schools and other institutional trust funds. Most of these State sections are used by ranchers with State permits for livestock grazing and also are leased by industry for energy and mineral exploration or development. Activities on the State land generally are not substantially

different than on the surrounding land administered by BLM.

BLM does not propose acquisition of State land as part of wilderness designation.

At the time the Draft EIS was prepared, the State of Utah proposed that certain parcels of State-owned land, within and adjacent to WSAs, be exchanged for parcels of public land in other areas. As reflected in the Draft EIS, the position of the State of Utah was that the requested exchanges must be: (1) initiated concurrently with legislation establishing any WSA as a wilderness area; (2) such exchanges must be completed within 180 days of designation; and (3) State land in-holdings identified for exchange by the State must be exchanged out if any part of the WSA is to become a wilderness area (Matheson, 1983 and 1984; Bangerter, 1985). If these conditions were not met, the State would not support a recommendation for wilderness. For the Draft EIS, the Utah Division of State Lands and Forestry prepared Appendix 3 which listed the specific in-held sections and adjacent lands identified for exchange.

During the comment period on the Draft EIS, the following comments were issued:

"... the Legislature urges the State Land Board not to trade any State sections out of any BLM wilderness study area." (Resolution S.C.R. No. 1) (Utah State Legislature, 1986)

"... the Board of State Lands and Forestry:

1. Reserves the right by virtue of its trust capacity to formulate a position on each proposed wilderness area that includes or substantially affects school trust lands;

2. Reserves its support of any eventual wilderness bill unless it provides a tradeout provision ... which specifies. . . that lands selected shall be identified prior to the passage of the bill, and the transfer of the lands shall be coincident with the passage of the bill. The provisions should also exclude the Bureau of Land Management from the NEPA and FLPMA processes as necessary;

3. Prefers that any wilderness bill provide for the exchange of land in lieu of present school trust land in-holdings within Federal reservations" (UDNRE, BSLF, 1986).

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Table 6
Counties by Alternative

Wilderness to be Designated by Alternative	Beaver	Carbon	Emery	Garfield	Grand	Iron	Juab	Kane	Lincoln (Nevada)	Millard	San Juan	Tooele	Uintah	Washington	Wayne
Proposed Action															
Acres	7,140	68,000	385,109	298,411	190,245	1,607	62,340	218,608	2,180	106,418	365,905	39,364	0	65,858	164,034
Percent of County	0.4	7.2	13.6	8.9	8.1	0.1	2.9	8.3	0.0	2.5	7.7	0.0	0.0	4.2	10.3
Percent of BLM Land in County	0.6	15.8	18.5	18.2	12.4	0.2	4.2	13.3	0.1	3.5	22.0	2.7	0.0	11.3	16.6
No Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regional Representative Areas															
Acres	7,140	68,000	235,084	93,256	93,820	0	28,500	91,361	0	29,242	230,825	28,884	0	0	50,504
Percent of County	0.4	7.2	8.3	3.0	4.0	0.0	1.3	3.5	0.0	0.7	4.6	0.7	0.0	0.0	3.2
Percent of BLM Land in County	0.6	15.8	11.3	5.7	6.1	0.0	1.9	5.5	0.0	1.0	13.1	2.0	0.0	0.0	5.1
Paramount Wilderness															
Acres	7,140	68,000	385,109	215,251	116,960	0	28,500	134,765	0	57,242	335,575	37,584	0	33,480	113,424
Percent of County	0.4	7.2	13.6	6.5	5.0	0.0	1.3	5.1	0.0	1.4	6.7	0.9	0.0	2.2	7.1
Percent of BLM Land in County	0.6	15.8	18.5	13.1	7.6	0.0	1.9	8.2	0.0	1.9	19.1	2.6	0.0	5.7	11.5
Interagency and Cluster															
Acres	0	87,020	380,265	365,804	323,295	4,433	30,740	593,590	0	84,770	355,070	48,650	2,496	48,313	162,286
Percent of County	0.0	9.2	13.7	11.0	13.7	0.2	1.4	22.6	0.0	2.0	7.0	1.1	0.1	3.1	10.2
Percent of BLM Land in County	0.0	20.2	18.3	22.3	21.1	0.5	2.1	36.0	0.0	2.8	20.2	3.4	0.2	8.3	16.4
All Wilderness															
Acres	7,140	87,020	446,610	528,958	347,495	4,433	92,390	639,958	5,400	265,600	387,595	99,150	44,958	88,501	190,626
Percent of County	0.4	9.2	15.7	15.8	14.7	0.2	4.2	24.4	0.1	6.2	7.7	2.2	1.6	5.7	12.0
Percent of BLM Land in County	0.6	20.2	21.4	32.2	22.7	0.5	6.2	39.0	0.3	8.8	22.0	6.9	3.4	15.1	19.3

Source: USDI, BLM, 1988b.

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"... tradeout provisions for in-held lands would have to be incorporated into any wilderness bill. At the same time, water rights would have to be addressed. Many water rights are filed in the name of the State on State land in some of the WSAs."

"The State is not prepared at this time to make a specific recommendation on each wilderness area."

"This (Appendix 3 of Draft EIS) should not be construed as meaning that the exchange of these lands will ultimately be requested, nor that these are the only lands the Division will want exchanged" (Bangerter, August 1986).

After receipt of the above comments, BLM requested that the State clarify its position and update Appendix 3 to clearly show the specific preferences for exchange or retention, in order to facilitate the EIS analysis. In 1987, BLM was advised informally that the State would consider each WSA on a case-by-case basis at some time in the future, subsequent to the Final EIS.

Although the position of the State Land Board and the Governor still indicates the desire for exchange of selected (but now unspecified) in-holdings, it is not possible for BLM to ascertain where such exchanges may be requested; consequently, the EIS analysis is based on the assumption that for any particular WSA, no State exchange would be proposed. The assumption also reflects that legal access to in-held State sections would be permitted over WSA lands, based on reasonable specific need and on BLM guidance to minimize impacts to wilderness values.

In 1983-1984, the State of Utah initiated a special Statewide exchange program to "exchange school lands for Federal lands to consolidate State lands to resolve in a rational and equitable manner some of the problems caused by the checkerboard pattern of land ownership" (UDNRE, 1985). Known as Project BOLD, this was a separate Statewide proposal not tied to the wilderness review process. Project BOLD would require Congressional approval. As originally conceived, the Project BOLD exchange program would have removed the State in-holdings from all but two of the WSAs. However, the State no longer is pursuing Project BOLD as previously conceived; therefore, at present, this separate Statewide exchange and block-in-gup program does not enter into the consideration of State in-holdings within WSAs. Although Project

BOLD occasionally is encouraged by some officials, it apparently does not have sufficient current support that it would successfully resolve the question of State in-holdings in WSAs.

Alternatively, limited future exchanges could be proposed in response to specific management requirements and analyzed on a case-by-case basis as necessary. Such exchanges could be completed under the authority of FLPMA or Section 5 of the Wilderness Act of 1964. It is noted that no formal approvals for exchange of State in-holdings in WSAs have been issued.

BLM does not propose acquisition of any private in-holdings unless requested on a case-by-case basis by the landowner, or unless conditions as discussed in Parts 5 and 7 of the BLM Wilderness Management Policy (BLM Manual 8560) should occur in the future.

The acreage of State and private in-holdings for each Statewide alternative is shown in Table 7. Other than the difference in acreage, the issue is the same for all the Statewide alternatives, except the No Action/No Wilderness Alternative. It is not repetitively explained for each Statewide alternative in the EIS.

Table 7
State and Private Inholdings
by Alternative

Alternative	Private Inholdings		State In-holdings ^a	
	Parcels	Acres	Sections ^b	Acres
Proposed Action	5	353.7	169	104,261
No Action	0	0	0	0
Regional Representative Areas	4	273.7	92	56,999.4
Paramount Wilderness	4	273.7	138	84,771.3
Interagency and Cluster	8	613.7	243	150,795
All Wilderness	16	3,998	294	183,248

Source: Appendix 3

^aIncludes sections with State surface and subsurface. There also are 10,272 acres of State subsurface in-held in BLM WSAs.

^bIncludes complete sections and portions of sections.

• Impacts on Specific Project Proposals

Conflicts with specific project proposals such as pipelines, power transmission lines, communication sites, military overflights, wildlife transplants, etc., are

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relevant only to specific WSAs or groups of WSAs. Therefore, this Final EIS analyzes these conflicts in the individual WSA analyses but does not address them for the Statewide alternatives.

- **Impacts Related to Aircraft Overflights**

Aircraft overflight is a condition that would occur with or without wilderness designation. This is particularly true for those WSAs with military training flight ranges, such as those in western Utah. Since wilderness designation alternatives would not change them, aircraft overflights are not analyzed for each Statewide alternative.

- **Impacts on Social Conditions**

Changes in social conditions are closely linked to changes in economic conditions, although often less apparent. Opportunities for future development in WSAs are identified for the No Action/No Wilderness Alternative. The most probable changes in future economic activities in WSAs and, therefore, social conditions are not projected to be extensive. Within the foreseeable future, existing land use activities in central and southern Utah are expected to continue. With the exception of possible long-term development of tar sand in three WSAs and coal development in seven WSAs, new industries are not foreseen that would create "boomtown" social conditions on a regional or Statewide basis. Consequently, with the No Action/No Wilderness Alternative, most future changes would be gradual, generally compatible with current lifestyles, and the social structure of small, widely separated rural communities would continue. Tourism, predominantly associated with southern Utah national parks and recreation areas, would continue to be accommodated and encouraged.

Since the WSAs now do not support high levels of economic development, the All Wilderness Alternative would not significantly change existing resource uses and related social conditions in the foreseeable future. Social attributes related to livestock grazing would continue, and Federal lease fee revenues foregone would have few local social implications. Wilderness could be used to help promote tourism; however, because of the type of use, it would not result in large or dramatic economic and related social changes in most local communities. Wilderness constraints could limit opportunities for future development in the long term; however, as noted above, opportunities foregone generally would not be substantial enough to create major impacts or changes. On the

other hand, designation of large wilderness areas in southern Utah could intensify current divergent perceptions and attitudes and could generate or increase social interaction concerns. Differing expectations among wilderness recreation users would affect sociological aspects related to individuals or user groups, particularly in small or topographically confined wilderness areas (Moore, et al., 1989). For example, research has shown that where motorized and nonmotorized use occurs together, the conflict is somewhat one-sided. Motorized users do not mind foot-travelers but hikers dislike very much to encounter machine users (Lucas, 1971 and 1980).

All of the other Statewide alternatives would range between the two alternatives (the No Action/No Wilderness and the All Wilderness) mentioned above. Since there would not be substantial differences in overall social conditions for any of the Statewide alternatives, social impacts are not analyzed in detail.

Issues Analyzed in Detail for Each Statewide Alternative

After considering public comment on the Draft EIS as part of the scoping process and reviewing factual information relative to the WSAs, BLM has identified four principal issues for analysis in the Statewide Overview. These are:

- Impacts on wilderness values including:
 - Impacts on naturalness.
 - Impacts on opportunities for solitude.
 - Impacts on opportunities for primitive and unconfined recreation.
 - Impacts on wilderness special features.
- Impacts on water uses.
- Impacts on mineral and energy exploration and production including:
 - Impacts on leasable mineral exploration and production.
 - Impacts on locatable mineral exploration and production.

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- Impacts on local economic conditions including:

Impacts on local employment.

Impacts on local sales.

Impacts on federal revenues and returns to the local economy.

Impacts on wilderness values are analyzed for each alternative because a major purpose of the EIS is to provide information on and address potential impacts on wilderness values. Impacts on other resources considered to be wilderness special features (such as special wildlife and plants) are also analyzed in the wilderness values sections. Impacts on water uses is included as an issue of high public concern that was not analyzed in the Draft EIS. Impacts on mineral and energy exploration and production are analyzed because the Wilderness Act and the FLPMA specifically require information to be submitted relative to the known and potential mineral values of proposed wilderness areas. Impacts on local economic conditions are analyzed because they outline and summarize the

collective impacts of the alternatives on other resource values and uses, such as recreation activities and livestock grazing.

AUTHORIZING ACTIONS AND SCHEDULES

As previously noted, Section 603 of FLPMA authorizes the wilderness study and Section 202 of FLPMA provides overall authority for land use planning. The wilderness study process is comprised of three basic phases: inventory, study, and reporting. These are diagrammed in Figure 2.

Some of the key steps and related timing of the actions required to complete the wilderness study process briefly are shown below:

STEP I

Identify roadless areas of 5,000 contiguous acres or larger (Section 603 areas). Smaller roadless areas contiguous to wilderness areas on other agency-administered land are also considered (Section 202 areas). Including public comment periods, this step was completed in August 1979.

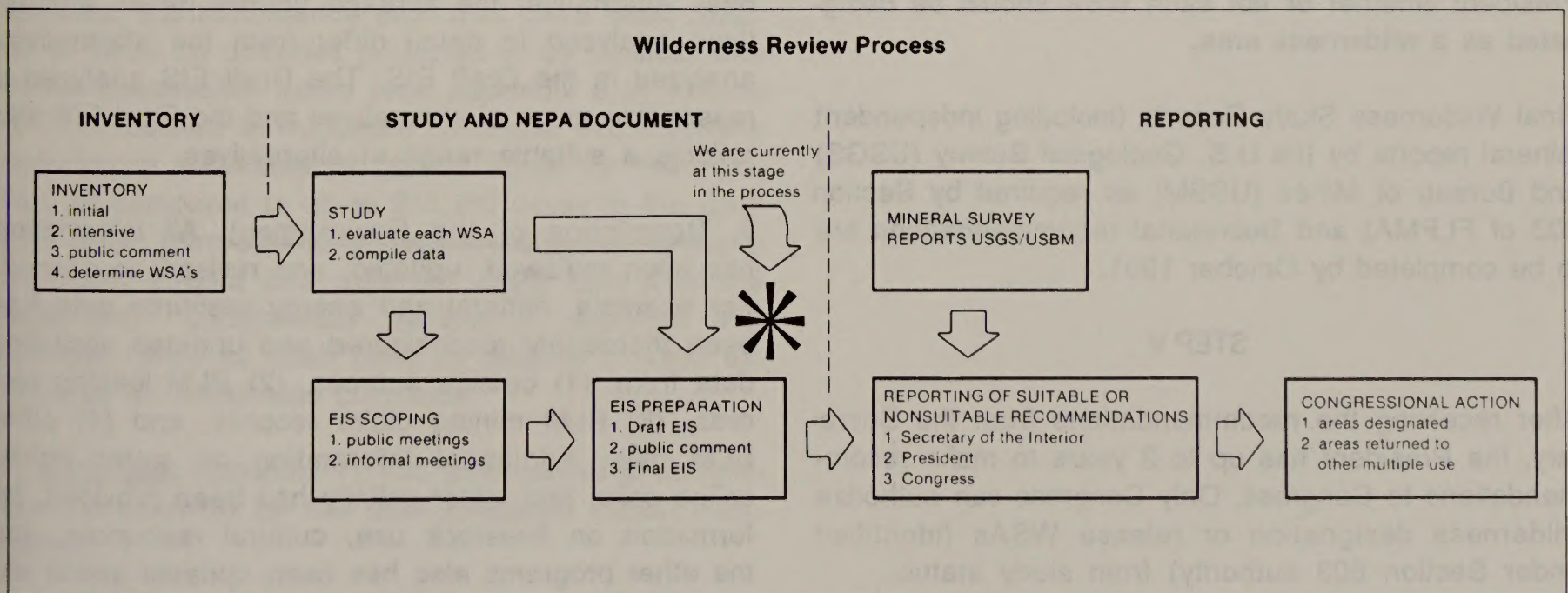


FIGURE 2

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STEP II

Roadless areas are to be inventoried to determine if wilderness characteristics are present. WSAs are identified. Including public comment periods, this was essentially completed in November 1980, with resolution of appeals to IBLA completed in April 1985.

Each WSA is to be studied to determine if it is suitable or unsuitable for recommendation as a wilderness area.

STEP III

This step includes evaluation and analysis of impacts for each WSA and analysis of Statewide alternatives in an EIS, and preparation of Wilderness Study Reports to be submitted by the Secretary of the Interior.

Original preliminary draft analyses were prepared primarily in 1982 and were made available for public review; the Draft EIS was prepared during 1984 and 1985 and made available for public review and comment in early 1986; with the Statewide Final EIS completed in 1990.

STEP IV

The Secretary of the Interior is to recommend to the President whether or not each WSA should be designated as a wilderness area.

Final Wilderness Study Reports (including independent mineral reports by the U.S. Geological Survey (USGS) and Bureau of Mines (USBM) as required by Section 603 of FLPMA) and Secretarial recommendations are to be completed by October 1991.

STEP V

After receiving the recommendations from the Secretary, the President has up to 2 years to make recommendations to Congress. Only Congress can authorize wilderness designation or release WSAs (identified under Section 603 authority) from study status.

Two Utah wilderness bills, H.R. 1500 and H.R. 1501, were introduced in early 1989 (see Appendix 2). Even though these bills have been introduced in advance of completion of the formal BLM wilderness review process, BLM wilderness recommendations will be made in compliance with the systematic process as outlined above.

CHANGES MADE FROM THE DRAFT EIS TO THE FINAL EIS

In response to the public comments received during the review of the Draft EIS, BLM has made numerous changes to the Statewide and individual WSA portions of the EIS.

The significant changes for Volume I are listed below. Changes for each specific WSA are listed in the Introductions and the individual WSA analyses in Volumes II through VI.

1. Issues: The issues have been revised to reflect the additional input from other agencies and the public during review of the Draft EIS. The impact analysis (Chapter 4) and the impact summary tables have been more sharply focused on the major issues that are analyzed in detail. Items determined by BLM to be the minor issues have been excluded from the detailed analysis, in order that the EIS focus clearly on the major factors.

2. Alternatives: The Statewide alternatives have been redefined and new alternatives have been considered. Four Statewide alternatives resulting from public comment have been described. All Statewide alternatives considered have been listed in a new table. Six Statewide alternatives have been used for detailed analysis. Except for the No Action/No Wilderness Alternative, the acreage figures for all alternatives analyzed in detail differ from the alternatives analyzed in the Draft EIS. The Draft EIS analyzed a reasonable range of alternatives and the Final EIS also reflects a suitable range of alternatives.

3. Description of the Environment: All information has been reviewed, updated, and revised as needed. For example, mineral and energy resource data has been thoroughly reconsidered and updated, including data from: (1) outside sources, (2) BLM leasing records, (3) BLM mining claim records, and (4) other BLM files. Additional information on water rights, saline soils, and water salinity has been provided. Information on livestock use, cultural resources, and the other programs also has been updated and/or expanded. Additional data tables have been provided.

4. BLM Land Use Plans: Completion of land use plans (House Range and Warm Springs RMPs) resulted in changes in the management scenarios for the No Action/No Wilderness Alternative and Partial Wilderness Alternative for WSAs in those areas, and for applicable Statewide alternatives. Other land use

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plans (Dixie, San Juan, San Rafael) which are near completion or under protest have not been incorporated in the description of these alternatives because the final provisions and dates of completion are unknown; however, some reference to these plans is made in the responses to public comments for the affected WSAs.

5. State Land In-holdings: The State position regarding exchanges of in-held and adjacent sections has changed since the Draft EIS. The State no longer proposes clearly defined and specific wilderness exchanges, and Chapter 1 has been revised accordingly. The detailed exchange proposal prepared by the State (Draft EIS, Appendix 3 in Volume I) has been revised as an informational list of State in-holdings. Sections adjacent to the WSAs have been deleted from the list. The analysis assumptions have been revised to indicate that State in-holdings would not be exchanged for any particular WSA.

6. Impact Analysis: Analysis assumptions and impacts have been clarified and focused on "reasonably foreseeable" expectations (CEQ, 1986). "The anticipated surface disturbance presented in the Draft EIS was based on the assumption that all mineral and other resources potentially within each WSA would be developed sometime in the future, without consideration of technical or economic feasibility. In response to public comments relative to the feasibility of developments, the disturbance estimates have been revised to focus on activities projected to be feasible within the foreseeable future (see Appendix 6 in Volume I). This resulted in maximum Statewide WSA surface disturbance estimates of 58,968 acres for the Final EIS, as compared to up to 215,967 acres in the Draft EIS. Short term and long term are clarified. Analysis regarding in-held and adjacent State land sections have been substantially revised in response to a changed State of Utah position relative to land exchanges for wilderness purposes.

7. Rationale: Appendix 11 has been added to summarize the rationale for the BLM Proposed Action Alternative.

8. Legislative Actions: Appendix 2 on scoping has been replaced with two House Bills (H.R. 1500 and H.R. 1501), dated March 20, 1989.

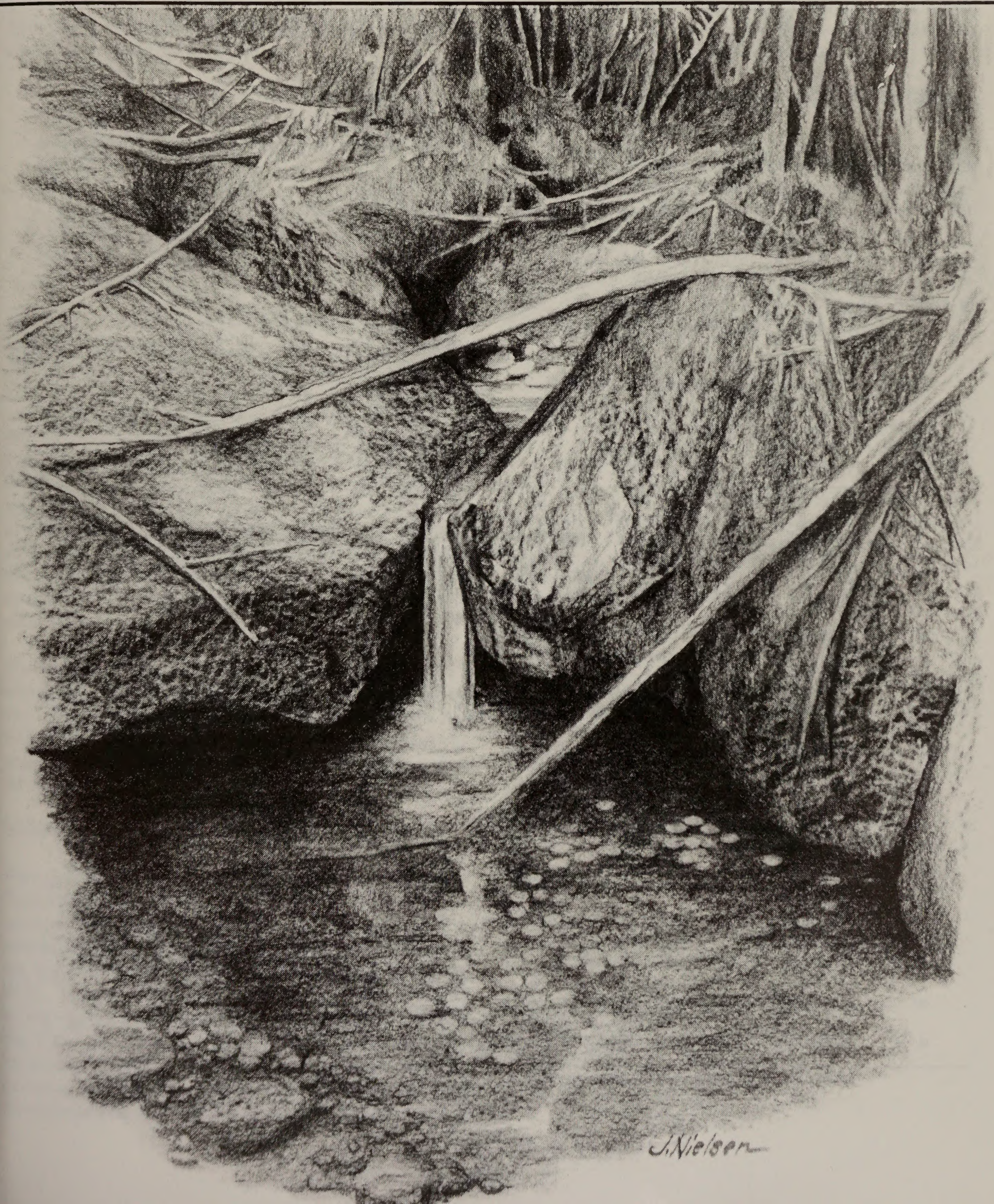
9. Public Comment Analysis: Analysis and response to public comments have been added. This topic is introduced briefly in Chapter 5, and then fully presented in Volumes VII-A, VII-B, and VII-C. Included are:

explanation of the public comment period and hearings on the Draft EIS; copies of letters from Congressional representatives, Federal agencies, State agencies, local agencies, State/local elected officials, and representative special interest groups; responses to general comments; and responses to specific comments.

10. Maps: All maps throughout the EIS have been checked and revised where necessary to be consistent with BLM inventory decisions. Maps in this EIS are drawn to represent WSA and alternative boundaries to the degree of accuracy available at a small scale. For more information, detailed, official maps are located in each BLM District office. All pocket maps showing Statewide alternatives have been revised. Pocket maps have been added to display a combined management alternative (wilderness and other special designations) and two citizen alternatives proposed by wilderness groups.

Chapter 2

Description of the Alternatives



CHAPTER 2

DESCRIPTION OF THE STATEWIDE ALTERNATIVES

OBJECTIVES

Two major objectives are associated with the identification of Statewide alternatives:

- First is to provide a cumulative overview of wilderness opportunities and significant impacts associated with BLM-administered lands throughout the State.
- Second is to describe and analyze several various Statewide combinations of BLM Wilderness Study Areas (WSAs) for information, review, and consideration.

Alternatives were formulated by BLM in response to input received from interested individuals and organizations during the formal scoping process, during preparation of the Draft EIS, and during the comment period on the Draft EIS. All comments and concerns, including those of BLM, were considered. Professional judgment and data interpretation have been applied by BLM in selection of WSAs for the various Statewide alternatives, except for those proposed in detail by others. Depending on individual perception, unlimited variations in the Statewide alternatives could be identified; however, BLM believes that the alternatives described here represent a sufficient array for consideration.

The ultimate decision by Congress to designate BLM wilderness in Utah may or may not precisely follow one of the specific alternatives analyzed in detail in this document; however, the range of alternatives analyzed is expected to provide a reasonable basis for selection.

SCOPING OF THE ALTERNATIVES

During scoping, BLM requested suggestions regarding Statewide alternatives and criteria for use in formulation of alternatives. Comments received relative to alternatives are found on pages 34 to 49 of the scoping booklet "Scoping Issues and Alternatives" (USDI, BLM, 1984c). Additional comments were received during review of the Draft EIS and these are found in the Final EIS, Volume VII-B, General Comment and Response Section 3. Many of the comments and suggestions pertaining to Statewide alternatives were considered and used in the aggregate to arrive at the

alternatives described in this chapter. Comments suggesting actions not within the constraints and intent of the NEPA, the FLPMA, the Wilderness Act, or the BLM Wilderness Study Policy were not used.

ALTERNATIVES IDENTIFIED FOR CONSIDERATION

A total of 21 Statewide alternatives have been identified and are listed in Table 8 for possible consideration. These include 15 alternatives not selected for detailed analysis and six alternatives analyzed in detail in the Final EIS. Certain of the alternatives are illustrated on Pocket Maps 1 thru 8, located in the back of Volume I. The BLM Proposed Action of 1,975,219 acres is shown on Pocket Map 1.

Table 8
Statewide Alternatives Suggested and/or Considered

Alternative	Wilderness BLM Acres	Analyzed in Detail In Final EIS
No Action/No Wilderness	0	Yes
Small Cluster Concept	851,271	No
Regional Representative Areas in Draft EIS	913,225	No
Regional Representative Areas in Final EIS	956,616	Yes
Combination Wilderness and Other Designations	1,250,209	No
Commodity Production in Draft EIS	1,376,408	No
Commodity Production in Final EIS	841,810	No
Paramount Wilderness Quality in Draft EIS	1,474,380	No
Paramount Wilderness Quality in Final EIS	1,533,030	Yes
Large Cluster Concept	1,759,870	No
Modified Suitability	1,841,548	No
BLM Proposed Action in Draft EIS	1,892,402	No
BLM Proposed Action in Final EIS	1,975,219	Yes
Highest Wilderness Quality	2,050,922	No
Cluster and Interagency Areas	2,486,732	Yes
Manageability	2,606,546	No
All Wilderness in Draft EIS	3,231,327	No
All Wilderness in Final EIS	3,235,834	Yes
Citizen Alternative: Utah Wilderness Association	3,843,090	No
Citizen Alternative: Utah Wilderness Coalition	5,027,897 ^a	No
Citizen Alternative: Earth First!	16,000,000 ^a	No

^a Includes undetermined amounts of non-BLM land.

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

SUMMARY DESCRIPTION OF STATEWIDE ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Each of the Statewide alternatives not analyzed in detail briefly are described to explain the nature and/or objective of the alternative, and the reason that it was not analyzed in detail. Some of these alternatives were noted in the Draft EIS and others have been added as a result of the public comments on the Draft EIS. Acreage for each alternative is given in Table 8.

Small Cluster Concept

This alternative was analyzed in detail in the Draft EIS (Draft EIS Tables 15 and 16). It was formulated in response to suggestions that clusters of wilderness areas might serve as tourist destinations for extended vacations, and thereby have greater local economic benefits than scattered wilderness areas. The alternative is comprised of WSAs or partial WSAs which were part of the BLM Proposed Action and met certain criteria for clusters. The alternative was not carried for detailed analysis in the Final EIS because it has been replaced with the Cluster and Interagency Areas Alternative which more fully represents the objective to analyze the potential of clustered wilderness areas relative to tourism and extended visits.

Combination Wilderness and Other Special Designations

Several comments on the Draft EIS suggested that protection of certain values in the WSAs could be attained by the selective use of other (nonwilderness) special designations, that would afford management options which could be broader and more adaptable than wilderness designation. In consideration of these suggestions, BLM has illustrated a combination alternative on Pocket Map 2. This alternative uses:

- wilderness designation in selected areas to assure full application of wilderness management criteria;
- wild and scenic river designations which may represent three levels of river management (recreation, scenic, or wild);
- national conservation or recreation area designations to accent a wide range of nationally significant resource opportunities;

- existing and potential identification of Areas of Critical Environmental Concern (ACECs) in BLM land use plans for ecological, scenic, and cultural resource protection; and
- other special designations (such as National Natural Landmark).

Special management plans would be tailored to each area and each type of designation to define specific management criteria, protective measures, and detailed plans.

BLM could further address those aspects of the alternative involving national designations such as national conservation or recreation areas, in a phased program if directed to do so by Congress. Some of the administrative special designations, such as ACECs, where they currently exist or may be in progress, are included in the No Action/No Wilderness Alternatives analyzed for individual WSAs. ACEC designations also are, or could be, reflected as part of BLM's normal land use planning process.

The alternative is not analyzed in detail in the Statewide Wilderness EIS because it would depend on substantial additional and independent studies applicable to meet the established procedures for each type of special designation. Consequently, portions of the alternative are beyond the intent and timeframe requirement of the wilderness review process mandated by FLPMA.

Commodity Production

This alternative would include only areas with little or no conflict with mineral resources, agriculture, big game habitat improvements, expansion of existing livestock grazing, community expansion, water resource developments, or utility or transportation corridors. In some cases, it may be difficult to fully determine the likelihood of future commodity production due to market uncertainties, unknown mineral conditions, or other factors; however, assumptions used in the analysis of individual WSAs are applied, including the possibilities for future development where such potential is considered reasonably foreseen in the long term. This alternative would represent no constraints from wilderness designation on projected future exploration and ultimate development, assuming that effective market conditions were present. The alternative would include all or parts of WSAs, where no commodity production development is foreseen. This alternative has been revised from the

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previous similar alternative contained in the Draft EIS. The WSA acreage in the revised commodity production alternative is 841,810 acres that would be designated wilderness as shown in Table 9. In essence, these are areas where no conflicts with nonwilderness uses are expected; therefore, they would retain wilderness values regardless of wilderness designation.

Table 9
WSAs Included in the Alternative Favoring Commodity Production

Map Reference Number or Letter	WSA Name	Acres
1	North Stansbury Mountains (P)	8,700
2	Cedar Mountains	50,500
3	Deep Creek Mountains (P)(D)	50,084
4	Fish Springs	52,500
5	Rockwell	9,150
6	Swasey Mountain (P)	34,376
7	Howell Peak	24,800
9	Notch Peak (P)(S)	51,130
10	King Top	84,770
11	Wah Wah Mountains	42,140
12	Cougar Canyon	15,968
13	Red Mountain (P)	12,842
15	LaVerkin Creek Canyon	567
16	Deep Creek	3,320
17	North Fork Virgin River	1,040
18	Orderville Canyon	1,750
20	Canaan Mountain (P)	33,800
25	The Cockscomb (P)	5,100
30	Steep Creek (P)	18,350
33	Scorpion	14,978
34	Escalante Canyons Tract 5	760
35	Fifty Mile Mountain (P)	51,540
36	Mt. Ellen-Blue Hills (P)	63,804
37	Bull Mountain (P)	11,800
41	Fiddler Butte (P)(S)	27,000
46	Grand Gulch Complex (P)	37,580
51	Dark Canyon Complex	68,030
52	Butler Wash	24,190
54	Indian Creek	6,870
72	Westwater Canyon (P)	26,000
A	Red Butte	804
B	Spring Creek Canyon (P)	1,607
C	The Watchman	600
D	Taylor Creek Canyon	35
E	Goose Creek Canyon	89
F	Beartrap Canyon	40
G	Fremont Gorge	2,540
I	Daniels Canyon	2,496
J	South Needles	160
Total		841,810

Source: WSA Analyses.

(P) Denotes Partial Wilderness Alternative for individual WSA.

(S) Indicates smaller of two Partial Wilderness Alternatives analyzed for the WSA.

(D) Partial analyzed in Draft EIS but not in Final EIS.

The alternative was not included for detailed analysis in the Final EIS because impacts would be essentially the same as for the No Action/No Wilderness Alternative. With both alternatives, the wilderness values would be adversely impacted in the same areas where development is predicted and the wilderness values would remain in the areas where development is not projected. There would be a difference in designation of wilderness, but no significant difference in environmental effects.

Large Cluster Concept

This alternative was described in the Draft EIS (Draft EIS, Tables 7 and 8). The objectives of this alternative are similar to the Small Cluster Concept Alternative. It differs from that alternative by including WSAs from the All Wilderness Alternative, rather than from the BLM Proposed Action. It is not analyzed in detail because the formulation of the Cluster and Interagency Alternatives for the Final EIS sufficiently represents this concept for analysis and further consideration.

Modified Sustainability

This alternative was suggested during scoping. It is defined in detail on pages 47 to 49 of the "Public Scoping Issues and Alternatives" booklet (USDI, BLM, 1984c). It is based on a preliminary BLM planning recommendation with specific boundary modifications for nine WSAs and the addition of two WSAs. It would include 1,841,548 acres with all or parts of 43 WSAs. It was not included for detailed study on a Statewide basis because it is generally similar (within 7 percent of the total acreage) to the BLM Proposed Action, and the nature and range of impacts would approximate those of the BLM Proposed Action.

BLM Proposed Action in the Draft EIS

This alternative was presented in detail in the Draft EIS (Draft EIS, Table 10). It is not analyzed in detail in the Final EIS because it has been replaced by a new BLM Proposed Action. The new proposed action is the result of revisions to the BLM Proposed Action in the Draft EIS, in response to public review and comment, and further consideration by BLM.

Highest Wilderness Quality

This alternative was described in the Draft EIS (Draft EIS, Table 5). It identifies the areas judged by BLM to have the highest quality wilderness values, without

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concern for potential conflicts with other resources. It would involve 2,050,922 acres in all or parts of 55 WSAs. It was not included for detailed analysis because the total WSA acreage generally is similar (within 4 percent of the total acreage) to the BLM Proposed Action. The BLM Proposed Action includes most of the high quality areas, except in those locations where the nonwilderness uses or resources are considered to outweigh the high wilderness values.

Manageability

This alternative was analyzed in detail in the Draft EIS (Draft EIS, Table 12). It has been deleted from further consideration and detailed analysis in the Final EIS, as a result of three factors: (1) a re-evaluation of manageability concerns related to ORV use and resultant policy determination that ORV use can be managed, even though it may be an administrative problem; (2) the number of oil and gas leases with prior existing rights has declined substantially; and (3) reconsideration that manageability is not a significant concern on a Statewide basis.

Citizen Alternatives

Three major alternatives were submitted by environmental groups for consideration as part of the public comments on the Draft EIS. These are the Utah Wilderness Association (UWA) proposal, Utah Wilderness Coalition (UWC) proposal, and the Earth First! proposal. The UWA and UWC proposals are compared with the BLM WSAs and the BLM Proposed Action Alternative in Appendix 12. Maps of the two alternatives are provided as Pocket Maps 3 and 4.

- Utah Wilderness Association

The UWA has proposed approximately 3.8 million acres of BLM wilderness in nine regions: the West Desert, the Zion/Canaan Mountain, the Escalante, the Kaiparowits Plateau, the Henry Mountains, the Dirty Devil Canyonlands, the Grand Gulch Plateau, the San Rafael, and the Desolation/Book Cliffs (UWA, 1985). The proposal is comprised of 84 individual areas (refer to Pocket Map 3). All of the acreage reported for this alternative is Federal land administered by BLM in Utah.

This alternative is not analyzed in detail in the Final EIS because it contains about 0.6 million acres outside the BLM WSAs. The WSAs were established through a systematic process. Wilderness values and intrusions were assessed, and certain areas were administra-

tively released from wilderness study as part of formal decisions on the BLM wilderness inventory (initial and intensive) that was conducted between 1978 and 1980. Numerous public meetings, and public comment and appeal periods were held throughout the inventory process so that citizens could become involved, participate in the inventory decisions, raise issues or concerns, and have those issues considered before proceeding to the study phase. After several protests, appeals, and lawsuits pertaining to the BLM Final Inventory Decisions, additional acres were included in the wilderness study bringing the total acreage under study to 3.2 million acres. Because the formal inventory and study processes have been completed with substantial review and participation by the public, lands outside the 3.2 million acres included in the BLM Wilderness Study are not addressed in detail in the Final EIS.

For example, the UWA proposal includes the Newfound-land Mountains, located west of the Great Salt Lake. BLM determined that the area lacks naturalness due to past mining activities and sheep grazing. Many roads, ways, and trails were cut into the mountains for access, plus water troughs and 47 check dams have been constructed along the edge of the mountains. Also, solitude is substantially affected by low-level (less than 100 feet) jet aircraft flights extending from the adjacent Air Force bombing and gunnery range. The BLM finding was appealed, but ultimately IBLA upheld the BLM decision to release this area from further wilderness study (USDI, BLM, 1980).

Another example is Colt Mesa, located west of Capitol Reef National Park. Here BLM identified an airstrip, roads, and ways as intrusions along the west part of the unit. Also opportunities for solitude and primitive recreation were not judged by BLM to be outstanding; however, the UWA alternative includes the area (USDI, BLM, 1980).

- Utah Wilderness Coalition

The UWC proposal is organized into eight regions: the West Desert, the Zion and Hot Desert Region, the Escalante and Kaiparowits Region, the San Rafael Swell, the Henry Mountains and Dirty Devil River Region, the Canyonlands Region, the Cedar Mesa Region, and the Book Cliffs and Uinta Basin Region. These regions are subdivided into 141 areas with a total acreage of about 5.1 million acres (refer to Pocket Map 4). The 5.1 million acres includes an undetermined but large acreage of State and private lands, and small areas of national forest and national recreation area along

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with BLM-administered lands. This acreage also includes approximately 24,100 acres of BLM lands in Utah that are being studied by BLM in Colorado and Nevada, and 3,352 acres in BLM Instant Study Areas (ISAs) that are not included in the 3.2 million acres analyzed in the Final EIS because they have already been studied and reported to Congress. Therefore, the UWC and BLM alternatives are not directly comparable because the 3.2 million acres reported for the BLM WSAs and BLM Proposed Action do not include State or private lands, do not include areas being studied by BLM in surrounding states, and do not include five ISAs already reported.

This alternative is not analyzed in detail in the Final EIS because it contains about 1.9 million acres outside the BLM WSAs. As noted above, the WSAs were determined based on a systematic process, including public input and appeals. The inventory reflects evaluation and the collective professional judgements by numerous BLM personnel, and this phase of the process has been concluded. The citizen alternatives reflect views regarding intrusions and wilderness characteristics that do not necessarily coincide with those of BLM.

For example, the UWC proposal includes a large area, referred to as Labyrinth Canyon, bisected by the Green River. BLM includes a portion of the area in the Horseshoe Canyon (North) WSA, along the west side of the Green River; however, the surrounding lands have many intrusions resulting from past uranium exploration and mining activities. BLM has determined that these intrusions significantly and adversely affect naturalness to the point that they disqualify these lands from further wilderness study.

As a second example, the UWC proposal includes large acreage located south of the San Rafael Swell. The BLM examination during the inventory found evidence of extensive human activities; such as roads, ways, livestock facilities, and remnants of mining activities. In addition, BLM observed that much of the area does not have attributes that would provide outstanding opportunities for solitude or primitive and unconfined recreation, due especially to sparse vegetation, the open aspect of the terrain, and the general lack of topographic variety (USDI, BLM, 1979b).

As an additional example, the UWC proposal includes lands within the Naval Oil Shale Reserve, which are under the formal jurisdiction of the Department of

Energy (DOE) (see the response to Specific Comment 66.5 in EIS Volume VII-C). Under agreement with DOE, BLM manages livestock grazing and certain other resources; however, the Naval Oil Shale Reserve does not have the same status as BLM-administered public land and is not subject to the wilderness review process of the FLPMA.

These examples typify why the UWC alternative is not analyzed in the Final EIS.

- Earth First!

The Earth First! proposal of 16 million acres cannot be compared with the BLM WSAs or alternatives because the 16 million acres included in the Earth First! proposal includes private, State, National Forest, and NPS lands. In addition, Earth First! has not submitted detailed maps of the alternative to BLM; however, apparently many existing roads and other developments that do not meet the Wilderness Act criteria are included. A generic map showing lands proposed for wilderness by Earth First! is included in Appendix 12.

This alternative is not analyzed in detail because of its generic nature and because apparently it extends far beyond the mandated responsibilities of the BLM wilderness review process.

DESCRIPTION OF STATEWIDE ALTERNATIVES ANALYZED IN DETAIL

Six Statewide alternatives ranging from No Action/No Wilderness to All Wilderness are analyzed in detail. These alternatives are comprised of various combinations of the No Action/No Wilderness, All Wilderness, and Partial Wilderness Alternatives analyzed for each of the 83 BLM WSAs in Volumes II through VI. Table 10 shows how the individual WSA alternatives are combined to form the Statewide alternatives and the total acreage of each alternative. Selected management components of the alternatives are displayed for comparison in Tables 11 through 15. The projected land disturbance estimated for each Statewide alternative is shown on Table 16.

Figure 3 illustrates the acreage that would be designated with each of the Statewide alternatives analyzed in detail.

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Table 10
Statewide Alternatives Analyzed in Detail in Final EIS

Map Reference Number	WSA Name	BLM Proposed Action		No Action/ No Wilderness		Regional Representative Areas		Paramount Wilderness Quality		Cluster and Interagency Areas		All Wilderness	
		Type	Acres	Type	Acres	Type	Acres	Type	Acres	Type	Acres	Type	Acres
1	North Stansbury Mountains	All	10,480	Nb	0	Nb	0	Partial	8,700	All	10,480	All	10,480
2	Cedar Mountains	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	50,500
3	Deep Creek Mountains	Partial	57,384	Nb	0	Partial	57,384	Partial	57,384	All	68,910	All	68,910
4	Fish Springs	Partial	33,840	Nb	0	Nb	0	Nb	0	Nb	0	All	52,500
5	Rockwell	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	9,150
6	Swasey Mountains	Partial	34,376	Nb	0	Nb	0	Nb	0	Nb	0	All	49,500
7	Howell Peak	Partial	14,800	Nb	0	Nb	0	Nb	0	Nb	0	All	24,800
8	Conger Mountain	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	20,400
9	Notch Peak	Partial	28,000	Nb	0	Nb	0	Partial	28,000	Nb	0	All	51,130
10	King Top	Nb	0	Nb	0	Nb	0	Nb	0	All	84,770	All	84,770
11	Wah Wah Mountains	Partial	36,382	Nb	0	Partial	36,382	Partial	36,382	Nb	0	All	42,140
12	Cougar Canyon	Partial	6,408	Nb	0	Nb	0	Nb	0	Nb	0	All	15,968
13	Red Mountain	Partial	12,842	Nb	0	Nb	0	Nb	0	Nb	0	All	18,290
14	Cottonwood Canyon	Partial	9,853	Nb	0	Nb	0	Nb	0	Nb	0	All	11,330
15	LaVerkin Creek	All	567 ^a	Nb	0	Nb	0	Nb	0	All	567 ^a	All	567 ^a
16	Deep Creek	All	3,320 ^a	Nb	0	Nb	0	Nb	0	All	3,320 ^a	All	3,320 ^a
17	North Fork Virgin River	All	1,040 ^a	Nb	0	Nb	0	Nb	0	All	1,040 ^a	All	1,040 ^a
18	Orderville Canyon	All	1,750 ^a	Nb	0	Nb	0	Nb	0	All	1,750 ^a	All	1,750 ^a
19	Parunuweap Canyon	Partial	17,888	Nb	0	Nb	0	Partial	17,888	All	30,800	All	30,800
20	Canaan Mountain	Partial	33,800	Nb	0	Nb	0	Partial	33,800	All	47,170	All	47,170
21	Moquith Mountain	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	14,830
22	The Blues	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	19,030
23	Mud Spring Canyon	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	38,075
24	Paria-Hackberry	Partial	95,042	Nb	0	Nb	0	Partial	59,670	All	136,222	All	136,222
25	The Cockscomb	Partial	5,100	Nb	0	Nb	0	Nb	0	All	10,080	All	10,080
26	Wahweap	Nb	0	Nb	0	Nb	0	Nb	0	All	134,400	All	134,400
27	Burning Hills	Nb	0	Nb	0	Nb	0	Nb	0	All	61,550	All	61,550
28	Death Ridge	Nb	0	Nb	0	Nb	0	Nb	0	All	62,870	All	62,870
29	Phipps-Death Hollow	Partial	39,256	Nb	0	Partial	39,256	Partial	39,256	All	42,731	All	42,731
30	Steep Creek	Partial	20,806	Nb	0	Nb	0	Partial	20,806	Nb	0	All	21,896
31	North Escalante Canyon/ The Gulch	Partial	91,558	Nb	0	Nb	0	Partial	91,558	All	119,752	All	119,752
32	Carcass Canyon	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	46,711
33	Scorpion	Partial	14,978	Nb	0	Nb	0	Partial	14,978	All	35,884	All	35,884
34	Escalante Canyon Tract 5	All	760 ^a	Nb	0	Nb	0	Nb	0	All	760 ^a	All	760 ^a
35	Fifty Mile Mountain	Partial	91,361	Nb	0	Partial	91,361	Partial	51,540	All	146,143	All	146,143
36	Mt. Ellen-Blue Hills	Partial	65,804	Nb	0	Partial	65,804	Partial	65,804	All	81,726	All	81,726
37	Bull Mountain	Partial	11,800	Nb	0	Nb	0	Nb	0	Nb	0	All	13,620
38	Dirty Devil	All	61,000	Nb	0	Nb	0	All	61,000	All	61,000	All	61,000
39	Horseshoe Canyon (South)	Partial	36,000	Nb	0	Nb	0	Nb	0	All	38,800	All	38,800
40	French Spring-Happy Canyon	Partial	11,110	Nb	0	Nb	0	Nb	0	Nb	0	All	25,000
41	Fiddler Butte	Partial	32,700	Nb	0	Nb	0	Nb	0	All	73,100	All	73,100
	The Block		5,700										
	Stair Canyon		27,000										
42	Mt. Pennell	Partial	25,800	Nb	0	Nb	0	Nb	0	All	74,300	All	74,300
43	Mt. Hillers	Partial	16,360	Nb	0	Nb	0	Nb	0	Nb	0	All	20,000

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Table 10 (Continued)
Statewide Alternatives Analyzed in Detail in Final EIS

Map Reference Number	WSA Name	BLM Proposed Action		No Action/ No Wilderness		Regional Representative Areas		Paramount Wilderness Quality		Cluster and Interagency Areas		All Wilderness	
		Type	Acres	Type	Acres	Type	Acres	Type	Acres	Type	Acres	Type	Acres
44	Little Rockies	All	38,700	Nb	0	All	38,700	All	38,700	Nb	0	All	38,700
45	Mancos Mesa	All	51,440	Nb	0	All	51,440	Partial	46,120	All	51,440	All	51,440
46	Grand Gulch	All	105,520	Nb	0	All	105,520	All	105,520	All	105,520	All	105,520
47	Road Canyon	All	52,420	Nb	0	Nb	0	Partial	45,720	All	52,420	All	52,420
48	Fish Creek Canyon	Partial	40,160	Nb	0	Nb	0	Partial	40,160	All	46,440	All	46,440
49	Mule Canyon	All	5,990	Nb	0	Nb	0	Nb	0	Nb	0	All	5,990
50	Cheesebox Canyon	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	15,410
51	Dark Canyon	All	68,030	Nb	0	All	68,030	All	68,030	All	68,030	All	68,030
52	Butler Wash	All	24,190	Nb	0	Nb	0	All	24,190	All	24,190	All	24,190
53	Bridger Jack Mesa	All	5,290	Nb	0	Nb	0	Nb	0	Nb	0	All	5,290
54	Indian Creek	All	6,870	Nb	0	Nb	0	Nb	0	All	6,870	All	6,870
55	Behind The Rocks	All	12,635	Nb	0	All	12,635	All	12,635	Nb	0	All	12,635
56	Mill Creek Canyon	All	9,780	Nb	0	Nb	0	Nb	0	Nb	0	All	9,780
57	Negro Bill Canyon	All	7,620	Nb	0	Nb	0	Nb	0	Nb	0	All	7,620
58	Horseshoe Canyon (North)	All	20,500	Nb	0	Nb	0	All	20,500	All	20,500	All	20,500
59	San Rafael Reef	All	59,170	Nb	0	All	59,170	All	59,170	All	59,170	All	59,170
60	Crack Canyon	All	25,335	Nb	0	Nb	0	All	25,335	Nb	0	All	25,335
61	Muddy Creek	All	31,400	Nb	0	Nb	0	All	31,400	Nb	0	All	31,400
62	Devils Canyon	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	9,610
63	Sids Mountain/Slds Cabin	Partial	80,084	Nb	0	Partial	80,084	Partial	80,084	All	80,970	All	80,970
64	Mexican Mountain	Partial	46,750	Nb	0	Nb	0	Partial	46,750	All	59,600	All	59,600
65	Jack Canyon	Nb	0	Nb	0	Nb	0	Nb	0	All	7,500	All	7,500
66	Desolation Canyon	Partial	224,850	Nb	0	Partial	224,850	Partial	224,850	All	290,845	All	290,845
67	Turtle Canyon	Partial	27,960	Nb	0	Nb	0	Partial	27,960	All	33,690	All	33,690
68	Floy Canyon	Partial	23,140	Nb	0	Nb	0	Partial	23,140	All	72,605	All	72,605
69	Coal Canyon	Partial	20,774	Nb	0	Nb	0	Nb	0	All	61,430	All	61,430
70	Spruce Canyon	Partial	14,736	Nb	0	Nb	0	Nb	0	All	20,350	All	20,350
71	Flume Canyon	Partial	16,495	Nb	0	Nb	0	Nb	0	All	50,800	All	50,800
72	Westwater Canyon	Partial	26,000	Nb	0	Partial	26,000	Partial	26,000	All	31,160	All	31,160
73	Winter Ridge	Nb	0	Nb	0	Nb	0	Nb	0	Nb	0	All	42,462
A	Red Butte	All	804 ^a	Nb	0	Nb	0	Nb	0	All	804 ^a	All	804 ^a
B	Spring Creek Canyon	Partial	1,607 ^a	Nb	0	Nb	0	Nb	0	All	4,433 ^a	All	4,433 ^a
C	The Watchman	All	600 ^a	Nb	0	Nb	0	Nb	0	All	600 ^a	All	600 ^a
D	Taylor Creek Canyon	All	35 ^a	Nb	0	Nb	0	Nb	0	All	35 ^a	All	35 ^a
E	Goose Creek Canyon	All	89 ^a	Nb	0	Nb	0	Nb	0	All	89 ^a	All	89 ^a
F	Beartrap Canyon	All	40 ^a	Nb	0	Nb	0	Nb	0	All	40 ^a	All	40 ^a
G	Fremont Gorge	Nb	0	Nb	0	Nb	0	Nb	0	All	2,540 ^a	All	2,540 ^a
H	Lost Spring Canyon	All	3,880 ^a	Nb	0	Nb	0	Nb	0	All	3,880 ^a	All	3,880 ^a
I	Daniels Canyon	Nb	0	Nb	0	Nb	0	Nb	0	All	2,496 ^a	All	2,496 ^a
J	South Needles	All	160 ^a	Nb	0	Nb	0	Nb	0	All	160 ^a	All	160 ^a
Total			1,975,219		0		956,616		1,533,030		2,486,732		3,235,834

Source: Volumes II through VI and USDI, BLM, Utah State Office.

^aProposed only in conjunction with adjacent NPS areas.

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Table 11
Summary of Minerals Management Actions for Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
<u>Oil and Gas Categories</u>						
<u>Leasing Category 1</u> (Standard Stipulations)						
Designated	0	0	0	0	0	0
Nondesignated	897,852	1,539,451	1,306,833	1,131,513	437,473	0
<u>Leasing Category 2</u> (Special Stipulations)						
Designated	0	0	0	0	0	0
Nondesignated	308,568	861,677	605,473	431,493	144,749	0
<u>Leasing Category 3</u> (No Surface Occupancy)						
Designated	0	0	0	0	0	0
Nondesignated	39,937	318,209	196,097	105,501	84,419	0
<u>Leasing Category 4</u> (Closed to Leasing)						
Designated	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated	14,258	516,497	170,815	34,297	82,461	0
<u>Oil and Gas Leases</u>						
<u>Pre-FLPMA Leases</u>						
Number Designated	47	0	13	20	64	93
Number Nondesignated	46	93	80	73	29	0
Acres Designated	22,381	0	5,174	8,554	49,878	65,479
Acres Nondesignated	43,098	65,479	60,305	56,925	15,601	0
<u>Post-FLPMA Leases</u>						
Number Designated	179	0	55	135	194	252
Number Nondesignated	73	252	197	117	58	0
Acres Designated	144,838	0	61,729	101,528	148,505	199,423
Acres Nondesignated	54,585	199,423	137,694	97,895	50,918	0
<u>Other Leases</u>						
Number Designated	10	0	0	0	76	101
Number Nondesignated	91	101	101	101	25	0
Acres Designated	9,860	0	0	0	92,517	123,669
Acres Nondesignated	113,809	123,669	123,669	123,669	31,152	0
<u>Mining Claims</u>						
Number Designated	4,062	0	1,857	2,977	3,107	5,527
Number Nondesignated	1,465	5,527	3,670	2,550	2,420	0
Acres Designated	81,240	0	37,140	59,540	62,140	110,540
Acres Nondesignated	29,300	110,540	73,400	51,000	48,400	0
<u>Withdrawn from Mineral Location</u>						
Acres Designated	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Acres Nondesignated	73,336	325,184	96,628	81,576	67,062	0

Source: Volumes II thru VI

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 12
Summary of Livestock Management Actions by Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
Number Allotments ^a						
Designated	225	0	69	156	239	337
Nondesignated	NA ^b	337	NA	NA	NA	0
Cattle AUMs						
Designated	40,933	0	16,741	33,504	56,494	72,240
Nondesignated	31,307	72,240	55,499	38,736	15,746	0
Sheep AUMs						
Designated	7,346	0	5,177	6,220	12,366	23,105
Nondesignated	15,759	23,105	17,928	16,885	10,739	0
Number Wild Horses and Burros						
Designated	210	0	60	114	171	579
Nondesignated	369	579	519	465	408	0
Existing Miles of Fence						
Designated	48.5	0	19.4	27.2	115.4	164.8
Nondesignated	116.3	164.8	145.4	137.6	49.4	0
Proposed Miles of Fence						
Designated	13	0	7.5	1	24.5	36
Nondesignated	23	36	28.5	35	11.5	0
Existing Treatment Acres						
Designated	1,980	0	1,980	1,980	2,330	2,990
Nondesignated	1,010	2,990	1,010	1,010	660	0
Proposed Treatment Acres						
Designated ^c	7,554	0	1,660	6,160	14,259	16,259
Nondesignated	8,705	16,259	14,599	10,099	2,000	0
AUMs from Proposed Treatments ^d						
Designated	942	0	390	866	3,111	3,408
Nondesignated	2,466	3,408	3,018	2,542	297	0

Source: Volumes II thru VI

^aDoes not total because of overlap in allotments and areas.

^bNot Applicable. Will not add to total because of overlap of grazing allotments with designated and nondesignated areas.

^cThe acres of proposed treatments in the designated areas would not be allowed.

^dIncludes AUMs attributable to land treatments for livestock, wildlife, and watershed proposed. A total of 28,209 acres of land treatments are proposed for livestock, wildlife, and watershed purposes.

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 13
Summary of Recreation Management Actions by Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
<u>ORV Categories</u>						
<u>Open Acres</u>						
Designated	0	0	0	0	0	0
Nondesignated	1,207,002	2,156,158	1,906,092	1,566,716	598,377	0
<u>Limited Acres</u>						
Designated	0	0	0	0	0	0
Nondesignated	42,380	575,013	239,315	122,155	67,590	0
<u>Closed Acres</u>						
Designated	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated	11,233	504,663	133,811	13,933	83,135	0
<u>Ways Open for Use (Miles)</u>						
Designated	0	0	0	0	453.7	0
Nondesignated	392	601.8	504.3	477.6	148.1	0
<u>Closed Ways (Miles)</u>						
Designated	0	77.5	77.5	77.5	77.5	0
Nondesignated	287.3	77.5	175	201.7	531.2	679.3
<u>Wild and Scenic Rivers (Miles)</u>						
Designated Candidate	323.5	0	235.5	314	363.5	376
Nondesignated Candidate	52.5	376	140.5	62	12.5	0

Source: Volumes II thru VI.

Table 14
Summary of Visual Resource Management Actions by Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
<u>Visual Resource Class I</u>						
Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	3,475	178,231	17,355	3,955	0	0
<u>Visual Resource Class II</u>						
Designated Acres	0	0	0	0	0	0
Nondesignated Acres	352,359	1,787,522	1,130,622	719,224	328,343	0
<u>Visual Resource Class III</u>						
Designated Acres	0	0	0	0	0	0
Nondesignated Acres	171,318	360,279	282,703	224,473	112,102	0
<u>Visual Resource Class IV</u>						
Designated Acres	0	0	0	0	0	0
Nondesignated Acres	733,463	909,802	848,538	755,152	308,657	0

Source: Volumes II thru VI.

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 15
Summary of Land Use Management Actions for Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Areas	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
<u>Private In-holdings</u>						
Designated Parcels	5	0	4	4	8	16
Nondesignated Parcels	11	16	12	12	8	0
Designated Acres	353.7	0	273.7	273.7	613.7	3,998
Nondesignated Acres	3,644.3	3,998	3,724.3	3,724.3	3,384	0
<u>State In-holdings</u>						
Designated Sections	169	0	92	138	243	294
Nondesignated Sections	125	294	202	156	51	0
Designated Acres	104,261	0	56,999.4	84,771.3	150,795	183,248
Nondesignated Acres	78,987	183,248	126,248.6	98,476.7	32,452.6	0
<u>State Grazing Permits</u>						
Designated Number	105	0	54	89	174	205
Nondesignated Number	100	205	151	116	31	0
Designated Acres	66,264	0	34,296	55,535	109,292	128,587
Nondesignated Acres	62,323	128,587	94,291	73,052	19,295	0
<u>State Mineral Permits</u>						
Designated Number	74	0	40	58	112	130
Nondesignated Number	56	130	90	72	18	0
Designated Acres	43,762.8	0	22,788	33,699.5	68,294.6	79,559.1
Nondesignated Acres	35,796.3	79,559.1	56,771.1	45,859.6	11,264.5	0
<u>Split Estate-State Minerals</u>						
Designated Sections	10.25	0	6	9	16	25.25
Nondesignated Sections	15	25.25	19.25	16.25	9.25	0
Designated Acres	3,777	0	2,292	3,492	6,168	10,432
Nondesignated Acres	6,655	10,432	8,140	6,940	4,264	0
<u>Existing Primitive/ACEC</u>						
Designated Acres	205,041	0	178,866	204,721	189,591	214,416
Nondesignated Acres	9,375	214,416	35,550	9,695	24,825	0
<u>Other Special Designations^a</u>						
Designated Acres	164,276.3	0	133,978.3	155,714.8	188,795.5	206,840.9
Nondesignated Acres	42,564.6	206,840.9	72,862.6	51,126.1	18,045.4	0
<u>Rights-of-Way</u>						
Designated Miles	10.25	0	0	9.25	9.75	28.5
Nondesignated Miles	18.25	28.5	28.5	19.25	18.75	0

Source: Volumes II thru VI and UDNRE, DSLF, 1988.

^aIncludes: Public Water Reserve (Withdrawal), Federal Right-of-Way (Appropriation) Material Site (Appropriation), Recreation and Public Purposes Classification (Segregation), Recreation Classification (Withdrawal), Bureau of Reclamation (Withdrawal), Multiple-Use Classification (Segregation), Power Site Classification (Withdrawal), Oil Shale (Withdrawal), Federal Power Project (Withdrawal), Power Site Reserve (Withdrawal).

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 16
Summary of Projected Disturbance for Statewide Alternatives

	BLM Proposed Action	No Action/ No Wilderness	Regional Representative Areas	Paramount Wilderness Quality	Cluster and Interagency Areas	All Wilderness
Potentially Designated Acres	1,975,219	0	956,616	1,533,030	2,486,732	3,235,834
Nondesignated Acres	1,260,615	3,235,834	2,279,218	1,702,804	749,102	0
<u>Leasable Minerals</u>						
Designated Acres	80	0	30	30	171	191
Nondesignated Acres	24,528	28,236	27,696	27,240	7,935	0
Total Acres	24,608	28,236	27,726	27,270	8,106	191
<u>Locatable Minerals</u>						
Designated Acres	249	0	128	199	193	312
Nondesignated Acres	250	1,077	682	454	440	0
Total Acres	499	1,077	810	573	633	312
<u>Livestock</u>						
Designated Acres	46	0	16	34	82	99
Nondesignated Acres	8,788	16,394	14,717	10,197	2,034	0
Total Acres	8,834	16,394	14,733	10,231	2,116	99
<u>Wildlife</u>						
Designated Acres	8	0	3	6	16	21
Nondesignated Acres	5,864	10,573	8,069	8,566	1,105	0
Total Acres	5,872	10,573	8,072	8,572	1,121	21
<u>Reservoir</u>						
Designated Acres	1	0	0	0	1	1
Nondesignated Acres	13	18	18	18	0	0
Total Acres	14	18	18	18	1	1
<u>Watershed</u>						
Designated Acres	5	0	0	1	17	17
Nondesignated Acres	415	1,424	1,424	723	400	0
Total Acres	420	1,424	1,424	724	417	17
<u>Access to Inheld Lands</u>						
Designated Acres	175	0	102	143	302	326
Nondesignated Acres	151	326	224	183	24	0
Total Acres	326	326	326	326	326	326
<u>Miscellaneous Projects^a</u>						
Designated Acres	0	0	0	0	25	50
Nondesignated Acres	675	910	910	676	650	0
Total Acres	675	910	910	676	675	50
<u>Total Disturbance</u>						
Designated Acres	564	0	279	413	807	1,017
Nondesignated Acres	40,684	53,968	53,740	48,057	12,588	0
Total Acres	41,248	58,968	54,019	48,470	13,395	1,017

Source: Appendix 6, Appendix 10, and Volumes II thru VI.

^aIncludes 500 acres for community expansion (Red Mountain WSA), 120 acres for development or expansion of campgrounds (Moquith Mountain and Mt. Hillers WSAs), 6 acres for community water developments (Spring Creek Canyon and Cottonwood Canyon WSAs), and 284 acres for development in rights-of-way (Paria-Hackberry, Steep creek, and North Escalante Canyon/The Gulch WSAs).

ALTERNATIVES ANALYZED

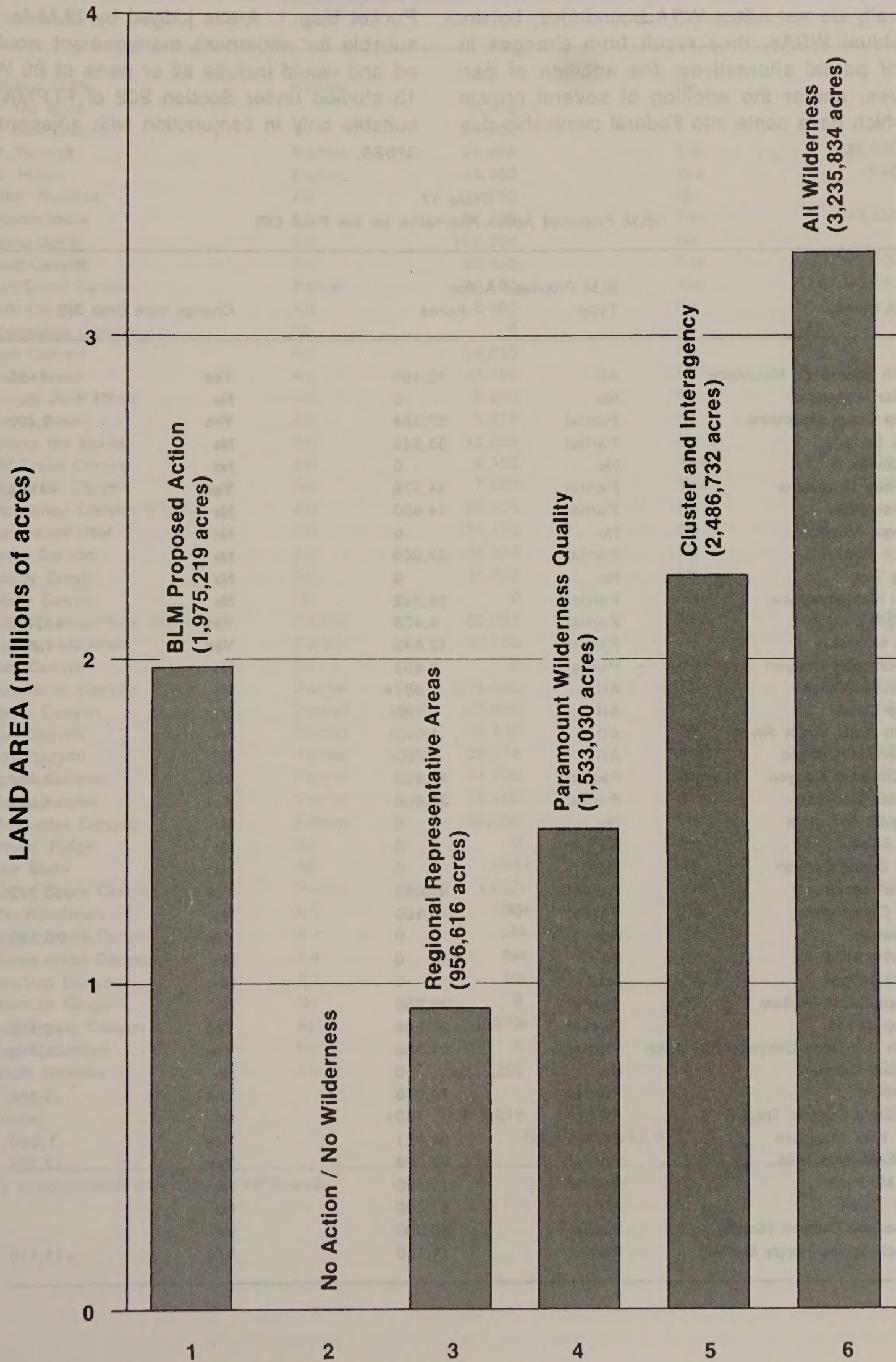


FIGURE 3

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

BLM Proposed Action in the Final EIS

The BLM Proposed Action in the Final EIS is a revision of the BLM Proposed Action from the Draft EIS. The revisions generally do not affect WSA boundaries, but for various individual WSAs, they result from changes in boundaries of partial alternatives, the addition of partial alternatives, and/or the addition of several private in-holdings which have come into Federal ownership due

to land exchanges. The specific acreage changes are shown in Table 17.

The BLM Proposed Action in the Final EIS is depicted on Pocket Map 1. Areas judged by BLM to have attributes suitable for wilderness management would be designated and would include all or parts of 66 WSAs, including 13 studied under Section 202 of FLPMA that would be suitable only in conjunction with adjacent National Park areas.

Table 17
BLM Proposed Action Alternative for the Final EIS

Map Reference Number	WSA Name	BLM Proposed Action Type	Acres	Change from Draft EIS	
1	North Stansbury Mountains	All	10,480	Yes	+480
2	Cedar Mountains	No	0	No	
3	Deep Creek Mountains	Partial	57,384	Yes	+6,400
4	Fish Springs	Partial	33,840	No	
5	Rockwell	No	0	No	
6	Swasey Mountains	Partial	34,376	Yes	-124
7	Howell Peak	Partial	14,800	No	
8	Conger Mountain	No	0	No	
9	Notch Peak	Partial	28,000	No	
10	King Top	No	0	No	
11	Wah Wah Mountains	Partial	36,382	No	
12	Cougar Canyon	Partial	6,408	Yes	+6,408
13	Red Mountain	Partial	12,842	Yes	-4,608
14	Cottonwood Canyon	Partial	9,853	No	
15	Laverkin Creek	All	567 ^a	No	
16	Deep Creek	All	3,320 ^a	No	
17	North Fork Virgin River	All	1,040 ^a	No	
18	Orderville Canyon	All	1,750 ^a	No	
19	Parunuweap Canyon	Partial	17,888	Yes	+3,788
20	Canaan Mountain	Partial	33,800	Yes	+1,000
21	Moquith Mountain	No	0	No	
22	The Blues	No	0	No	
23	Mud Spring Canyon	No	0	No	
24	Paria-Hackberry	Partial	95,042	Yes	+35,772
25	The Cockscomb	Partial	5,100	No	
26	Wahweap	No	0	Yes	-70,380
27	Burning Hills	No	0	No	
28	Death Ridge	No	0	No	
29	Phipps-Death Hollow	Partial	39,256	No	
30	Steep Creek	Partial	20,806	Yes	+2,456
31	North Escalante Canyons/The Gulch	Partial	91,558	Yes	-8,742
32	Carcass Canyon	No	0	No	
33	Scorpion	Partial	14,978	Yes	+5,358
34	Escalante Canyon Tract 5	All	760 ^a	No	
35	Fifty Mile Mountain	Partial	91,361	Yes	-1,080
36	Mt. Ellen-Blue Hills	Partial	65,804	Yes	+7,324
37	Bull Mountain	Partial	11,800	No	
38	Dirty Devil	All	61,000	No	
39	Horseshoe Canyon (South)	Partial	36,000	No	
40	French Spring-Happy Canyon	Partial	11,110	Yes	+11,110

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 17 (Continued)
BLM Proposed Action Alternative for the Final EIS

Map Reference Number	WSA Name	BLM Proposed Action Type	Acres	Change from Draft EIS	
41	Fiddler Butte	Partial		No	
	The Block		5,700		
	Stair Canyon		27,000		
42	Mt. Pennell	Partial	25,800	Yes	+25,800
43	Mt. Hillers	Partial	16,360	Yes	-640
44	Little Rockies	All	38,700	No	
45	Mancos Mesa	All	51,440	Yes	+5,320
46	Grand Gulch	All	105,520	No	
47	Road Canyon	All	52,420	Yes	+6,700
48	Fish Creek Canyon	Partial	40,160	Yes	+4,940
49	Mule Canyon	All	5,990	No	
50	Cheesebox Canyon	No	0	No	
51	Dark Canyon	All	68,030	No	
52	Butler Wash	All	24,190	No	
53	Bridger Jack Mesa	All	5,290	No	
54	Indian Creek	All	6,870	No	
55	Behind the Rocks	All	12,635	No	
56	Mill Creek Canyon	All	9,780	Yes	+9,780
57	Negro Bill Canyon	All	7,620	Yes	+7,620
58	Horseshoe Canyon (North)	All	20,500	No	
59	San Rafael Reef	All	59,170	No	
60	Crack Canyon	All	25,335	No	
61	Muddy Creek	All	31,400	No	
62	Devils Canyon	No	0	No	
63	Sids Mountain/Sids Cabin	Partial	80,084	Yes	+1,676
64	Mexican Mountain	Partial	46,750	No	
65	Jack Canyon	No	0	No	
66	Desolation Canyon	Partial	224,850	Yes	-17,150
67	Turtle Canyon	Partial	27,960	Yes	-5,730
68	Floy Canyon	Partial	23,140	No	
69	Coal Canyon	Partial	20,774	Yes	+20,774
70	Spruce Canyon	Partial	14,736	Yes	+14,736
71	Flume Canyon	Partial	16,495	Yes	+16,495
72	Westwater Canyon	Partial	26,000	No	
73	Winter Ridge	No	0	No	
A	Red Butte	All	804 ^a	No	
B	Spring Creek Canyon	Partial	1,607 ^a	Yes	-2,826
C	The Watchman	All	600 ^a	No	
D	Taylor Creek Canyon	All	35 ^a	No	
E	Goose Creek Canyon	All	89 ^a	No	
F	Beartrap Canyon	All	40 ^a	No	
G	Fremont Gorge	No	0	No	
H	Lost Spring Canyon	All	3,880 ^a	No	
I	Daniels Canyon	No	0	No	
J	South Needles	All	160	Yes	+160
					+194,097
	Totals		1,975,219		-111,280
				Net Change +82,817	

^aProposed only in conjunction with adjacent NPS areas.

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

With this alternative, 1,975,219 acres of Federal land would be designated as wilderness (refer to Pocket Map 1) and would be managed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560). The remaining 1,260,615 acres within the WSAs but not designated as wilderness would be managed generally as described for the No Action/No Wilderness Alternative.

- Management Conditions and Constraints

The 1,975,219 acres of designated wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sales. Development work, extraction, and patenting would be allowed to continue on 4,062 existing mining claims (81,240 acres), provided they are valid. After designation, all or part of 226 existing pre- and post-FLPMA oil and gas leases, involving 167,219 acres, would be phased out on expiration unless an oil or gas find in commercial quantities is shown. The 22,381 acres in 47 existing pre-FLPMA leases and leases currently held by production or within unit agreements could be developed in the designated areas with impairment to wilderness values. The remaining 179 existing post-FLPMA leases (144,838 acres) would continue to be subject to nonimpairment provisions.

Existing oil and gas leases in Special Tar Sand Areas (STSAs) that are under application for conversion to combined hydrocarbon leases could be converted with nonimpairment stipulations. Since it would be very difficult for tar sand development to meet nonimpairment requirements, it is projected that no development would occur in designated wilderness areas. Approximately 18,820 acres under lease conversion applications in three WSAs would be located in the designated area.

No existing coal leases or preference right lease application areas would be located in the designated areas.

In the 1,260,615 acres within the WSAs not designated wilderness, 1,187,279 acres would be open to future mineral location, while 73,336 acres would remain withdrawn from mining claim location. In the undesignated areas, development work, extraction, and patenting of 1,465 mining claims (29,300 acres) and future mining claims could occur without wilderness consideration. About 97,683 acres of existing post- and pre-FLPMA oil and gas leases and 76,038 acres in 64 existing coal leases could be developed without wilderness consideration. Four coal preference right lease applications in the Death Ridge WSA (22,964 acres) could be approved and developed. About 28,811 acres of existing oil and gas leases in three WSAs could be

converted to combined hydrocarbon leases, consistent with BLM land use plans and leasing category system for tar sand development without nonimpairment considerations. Interim wilderness protection provisions would be eliminated at the conclusion of the wilderness review process. The 1,260,615 acres not designated would be managed as oil and gas leasing Category 1 (standard stipulations) on 897,852 acres, Category 2 (standard and special stipulations) on 308,568 acres, Category 3 (no surface occupancy) on 39,937 acres, and Category 4 (closed to leasing) on 14,258 acres.

Domestic livestock grazing would continue to occur on the 1,975,219 acres of wilderness. The 48,279 animal unit months (AUMs) in the designated areas would remain available to livestock as presently allotted and as determined by forage conditions. The existing developments for livestock could be used and maintained as in the past based on practical necessity and reasonableness. Proposed new rangeland projects (including six water catchments, 11.5 miles of pipeline, one storage tank, one stock tank, one well, 13 miles of fence, and 15 spring or seep improvements to enhance livestock distribution) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. Because of major impacts to wilderness values, 7,554 acres of potential vegetation treatment and 22 livestock reservoirs would not be allowed in designated areas.

For the 1,260,615 acres of nonwilderness, grazing use of 47,066 AUMs would continue in accordance with applicable BLM lands use plans, and proposed new rangeland developments for livestock (including 8,705 acres of vegetation treatment to produce 2,466 AUMs [AUMs include those attributable to treatments for livestock, wildlife, and watershed purposes], four water catchments, 20.7 miles of pipeline, four wells, 23 miles of fence, 36 spring or seep projects, and 32 livestock reservoirs) could be allowed in these areas without concern for wilderness management.

With the 1,975,219 acres of wilderness, about 1,000 acres of vegetation treatment for watershed purposes (one WSA) would not be allowed. In the nondesignated areas of the WSAs, water resource facilities would be allowed if consistent with BLM land use plans, including about 400 acres of vegetation treatments for watershed improvement.

A municipal water well in the Cottonwood Canyon WSA would be in the nondesignated area and could be redeveloped, while a proposed municipal spring development in the Spring Creek Canyon WSA would be in the

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

designated area and would not be allowed. Several in-stream structures proposed for watershed purposes in the Coal, Floy, Spruce, and Flume Canyon WSAs would be allowed.

On the 1,975,219 acres of wilderness, about 4,700 acres of proposed vegetation treatment for wildlife and one proposed reservoir would not be allowed. One catchment, eight guzzlers, and 10 springs could be developed in the designated area consistent with wilderness protection criteria. In the remaining 1,260,615 acres of nonwilderness, about 5,850 acres of proposed land treatments, 16 catchments, 10 guzzlers, and three springs could be developed without concern for wilderness management.

The 1,975,219 acres would be closed to ORV use. About 209.8 miles of existing ways and trails would not be available for vehicle use except for: (1) those users with valid existing rights, if approved by BLM in accordance with 43 CFR 2920 provisions; (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments; or (3) necessary and reasonable access to private and State in-holdings. The nondesignated WSA areas, including 392 miles of existing ways, would remain available to vehicular travel in accordance with BLM land use plans. Of the 1,260,615 acres in the nondesignated areas, 1,207,002 acres would be open to ORV use, while vehicles would be limited to existing roads and trails on 42,380 acres, and 11,233 acres would be closed to ORV use.

All of the 1,975,219 acres in the designated wilderness areas would be closed to commercial and personal woodland harvest except for the use of wood for campfires in authorized locations. Also, about 23,174 acres in the nondesignated areas would remain closed to harvest while the remaining areas within the nondesignated portion of the WSAs would be open to woodland harvest in specific locations as annually specified by BLM.

All of the 1,975,219 acres of designated wilderness would be managed as Visual Resource Management (VRM) Class I. The 1,260,615 acres in nondesignated areas would be managed as: Class I (allow only natural ecological change) on 3,475 acres; Class II (changes not visually evident) on 352,359 acres; Class III (changes evident, but visually subordinate to the dominant landscape) on 171,318 acres; and Class IV (changes evident, but integrated where possible) on 733,463 acres. (Refer to Appendix 7 for descriptions of the VRM rating systems.)

With this alternative, 205,041 acres of existing Primitive Areas, Outstanding Natural Areas (ONAs), and Areas of Critical Environmental Concern (ACECs) in 10 WSAs would be in the designated wilderness. About 9,375 acres of these existing administrative designations in two WSAs would be in nonwilderness areas.

In 41 of the designated wilderness areas, a total of 164,276.3 acres of special designations such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., would be reviewed for compatibility with wilderness management. Incompatible designations would be revoked.

In the nondesignated WSAs and portions of WSAs, a total of 42,564.6 acres of special designations in 27 areas would continue without wilderness considerations and would be reviewed as part of BLM's land use planning process.

Within the 1,975,219 acres of designated wilderness, 353.7 acres of private land and 104,261 acres of State land would occur as in-holdings. Private in-holdings would involve five tracts in three WSAs. State in-holdings would include about 169 scattered sections in 36 WSAs. Because of the current State position and BLM policy concerning private lands, it is assumed that in-holdings in wilderness areas would not be acquired (see Chapter 1) and that development activities involving certain holdings would occur in 22 WSAs where new access would be required.

In the nondesignated WSAs, 11 private (3,644.3 acres) and 125 State (78,987 acres) in-holdings could be accessed without concern for wilderness management.

• Action Scenario

It is projected that in the foreseeable future 41,248 acres of surface disturbance would result in the WSAs in the foreseeable future with implementation of the BLM Proposed Action Alternative (see Table 16, Appendix 6, and Appendix 10). A total of approximately 564 acres of surface disturbance would occur in 40 of the 66 designated WSAs. Approximately 329 acres of the disturbance would occur in 24 WSAs due to mineral activities, including development of existing valid mining claims, and oil and gas exploration and development on pre-FLPMA leases or unitized leases held by production. It is projected that a total of 175 acres of designated wilderness would be disturbed in 22 WSAs for provision of access to in-held State lands. Approximately 60 acres in 19 WSAs would be disturbed for

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development of allowable projects for livestock, wildlife, and watershed purposes.

Approximately 40,684 acres of surface disturbance is projected to occur in the 17 nondesignated WSAs and the nondesignated portions of 37 WSAs. Of this disturbance, about 24,778 acres would be disturbed in 25 nondesignated areas by mineral exploration and development activities. About 23,575 acres of the mineral-related disturbance would result from coal and tar sand development in 12 WSAs in the long-term future (beyond the year 2020). A projected 151 acres of disturbance would result in 18 nondesignated areas for provision of access to State lands.

A total of 15,080 acres of disturbance would occur in 26 nondesignated areas due to development of projects and land treatments for livestock, wildlife, and watershed purposes, while 675 acres of disturbance would occur in six nondesignated areas as a result of community expansion, campground construction, development of rights-of-way, and reconstruction of a community water well.

No Action/No Wilderness Alternative

With this alternative, none of the 83 WSAs (or WSA complexes) would be designated by Congress as part of the NWPS. All areas would continue to be managed in accordance with the applicable BLM Management Framework Plans (MFPs) or Resource Management Plans (RMPs).

• Management Conditions and Constraints

Unless revised by future BLM land use planning and withdrawal actions, about 2,910,650 acres in the WSAs would remain open to mineral location, development work, extraction, and patenting, while about 325,184 acres in WSAs would remain withdrawn from location of mining claims.

The 3,235,834 acres in the WSAs would be managed for oil and gas leasing, including approximately 264,902 acres of 345 existing pre- and post-FLPMA leases (as of April 1989), and new leases within the BLM leasing category system, as follows: Category 1 (standard stipulations) on 1,539,451 acres; Category 2 (standard and special stipulations) on 861,677 acres; Category 3 (no surface occupancy) on 318,209 acres; and Category 4 (closed to leasing) on 516,497 acres.

The 264,902 acres of existing oil and gas leases in 44 WSAs and 76,038 acres of existing coal leases in seven

WSAs could be developed without regard to wilderness management. Four coal preference right lease applications covering approximately 22,964 acres of the Death Ridge WSA could be approved.

About 47,631 acres of oil and gas leases in four WSAs are involved in lease conversion applications for future tar sand projects by either strip mine or in-situ methods (USDI, BLM, 1984b). With this alternative, it is projected that any interim protection stipulations to protect wilderness values during the wilderness review process would be eliminated. Tar sand, as well as other leasable minerals (such as oil shale, coal, and potash), could be explored for and extracted without wilderness management concerns. Even though minerals would be managed as described above, oil shale and potash are not expected to be explored or developed in the WSAs in the foreseeable future.

The present livestock grazing use of 95,345 AUMs could continue in accordance with BLM land use plans and forage conditions. Use and maintenance of existing livestock facilities would continue. Proposed new range-land facilities (including 16,259 acres of vegetative treatments to produce an estimated 3,408 additional AUMs [includes AUMs from livestock, wildlife, and watershed treatments], six wells, 36 miles of fence, 51 spring or seep developments, 54 livestock reservoirs, 32.2 miles of pipeline, six water catchments, one stock tank, and one water storage tank) could be implemented without wilderness considerations. In general, such projects would be carried out to improve livestock distribution and reduce competition between livestock and wildlife.

Proposed developments for wildlife habitat, water projects, and other resources (including 10,550 acres of vegetation treatment for wildlife, one wildlife water reservoir, 17 catchments, 18 guzzlers, and 1,400 acres of land treatment for watershed improvement) would be allowed without wilderness consideration, if in conformance with BLM land use planning documents. Such projects would be to improve wildlife habitat by increasing desirable habitat and forage plant species and providing water in dry locations.

Proposed municipal water developments in the Cottonwood Canyon and Spring Creek Canyon WSAs would be allowed, as would placement of instream structures in the Floy, Coal, Spruce, and Flume Canyon WSAs.

All areas not currently closed would be open to ORV use, including 601.8 miles of ways within the 83 WSAs (or WSA complexes). About 2,156,158 acres would re-

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main open to ORV use. Use would remain limited to existing roads, ways, and trails on 575,013 acres, and about 504,663 acres in 20 WSAs would remain closed to ORV use. About 77.5 miles of existing ways would continue to be closed to vehicle use. Future BLM planning could selectively close some additional areas on a case-by-case basis for other than wilderness purposes. Regardless of the ORV management designations, actual use by ORVs would continue to be limited by rough and steep terrain in many locations.

About 3,667,263 acres would remain open to forest product harvest in specific locations as annually determined by BLM. About 568,571 acres would continue to be closed to cutting of posts, firewood, and Christmas trees.

The WSAs would continue to be managed under the BLM VRM system with: Class I on 178,231 acres; Class II on 1,787,522 acres; Class III on 360,279 acres; and Class IV on 909,802 acres.

About 114,796 acres currently in ONA or ACEC status in 12 WSAs would continue and about 99,620 acres in existing primitive area status (two ISAs) would be converted to ACECs. A variation with the No Action/No Wilderness Alternative would be the potential for administrative designation of other selected WSA areas as ACECs as established by future BLM land use plans. While not a substitute for wilderness designation, protective measures generally are associated with ACECs to manage special resource values. This could involve ORV closure and mineral leasing closure in key locations, and other such protective activities similar to those actions associated with wilderness management. This would not make the areas part of the National Wilderness Preservation System.

Designation of ACECs is a routine function of the BLM planning process not requiring special Congressional action. Administrative designations of ACECs by BLM would be separate actions that could be considered for a small number of selected locations subsequent to Congressional action on the wilderness review; therefore, this variation of the No Action/No Wilderness Alternative is not considered further as part of the wilderness study. (Also, see the previous narrative in this chapter concerning the Statewide alternative entitled "Combination Wilderness and Other Designations.")

A total of 206,840.9 acres of special designations such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., in 51 WSAs

would continue without wilderness considerations and would be reviewed as part of BLM's land use planning process.

Current conditions would continue regarding the 3,998 acres of private in-holdings (16 parcels in eight WSAs) and 183,248 acres of State in-holdings (about 294 scattered sections) within 52 of the WSAs. Generally, these in-held lands would continue to be undeveloped; although State sections would continue to be used for livestock grazing and mineral leasing. Mineral exploration and/or development is predicted to require new access to State lands in conjunction with other mineral activities in 30 WSAs (see Appendix 10).

• Action Scenario

It is projected that approximately 58,968 acres of the BLM WSAs would be disturbed in the foreseeable future with the No Action/No Wilderness Alternative (see Table 16, Appendix 6, and Appendix 10). Approximately 29,323 acres in 47 of the WSAs would be disturbed by mineral-related activities, including coal and tar sand production, and exploration and production of oil and gas and locatable minerals. Approximately 25,925 acres of this projected disturbance would occur in 12 WSAs and would result from coal and tar sand activities in the long-term future. Three hundred and twenty-six acres of disturbance is projected for construction of access to in-held State lands in 30 WSAs.

About 28,409 acres in 37 WSAs would be disturbed by development of projects and vegetation treatments for livestock, wildlife, and watershed purposes, while about 910 acres in eight WSAs would be disturbed by community expansion, campground construction, rights-of-way, a community water well, and a water pipeline.

Overall, no appreciable disturbance is projected in the foreseeable future in 21 of the BLM WSAs.

Regional Representative Areas Alternative

With this alternative, selected areas in each of the five regions would be designated, generally to represent typical overall physical and biological wilderness attributes. This would include all or parts of 14 WSAs. Several possibilities exist for selection of the WSAs which typify each region; those shown in this alternative reflect selections by the respective BLM Districts.

The WSAs included in this alternative are listed on Table 18 and shown on Pocket Map 5. With this alternative, 956,616 acres of Federal land would be

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designated as wilderness and would be managed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560). The remaining 2,279,218 acres within the WSAs but not designated as wilderness would be managed generally as described for the No Action/No Wilderness Alternative.

Table 18
WSAs Included in the
Regional Representative Areas Alternative

Region	Map Reference Number	WSA Name	Acres	Subtotal
West-Central	3	Deep Creek Mountains (P)	57,384	93,766
	11	Wah Wah Mountains (P)	36,382	
South-East	29	Phipps-Death Hollow (P)(L)	39,256	130,617
	35	Fifty Mile Mountain (P)(L)	91,361	
South-Central	36	Mt. Ellen-Blue Hills (P)	65,804	104,504
	44	Little Rockies	38,700	
South-East	45	Mancos Mesa (P)	51,440	237,625
	46	Grand Gulch	105,520	
	51	Dark Canyon	68,030	
	55	Behind The Rocks	12,635	
East-Central	59	San Rafael Reef	59,170	390,104
	63	Sids Mountain /Sids Cabin (P)	80,084	
	66	Desolation Canyon (P)(L)	224,850	
	72	Westwater Canyon (P)	26,000	
Grand Total				956,616

Source: WSA Analyses; Pocket Map 5.

(P) Denotes Partial Wilderness Alternative for individual WSA.

(L) Indicates larger of two Partial Wilderness Alternatives analyzed for the WSA.

(S) Indicates smaller of two Partial Wilderness Alternatives analyzed for the WSA.

• Management Conditions and Constraints

The 956,616 acres of wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sales. In the wilderness areas, development work, extraction, and patenting would be allowed to continue on 1,857 existing mining claims (37,140 acres), provided they are valid. After designation, 68 existing pre- and post-FLPMA oil and gas leases, involving 66,903 acres in eight WSAs, would be phased out on expiration unless an oil or gas find in commercial quantities is shown. The 5,174 acres of existing pre-FLPMA leases or leases currently held by production or within unit

agreements could be developed in the designated areas with impairment to wilderness values. The remaining 61,729 acres of existing post-FLPMA leases would continue to be subject to non-impairment provisions.

No coal leases, coal preference right lease applications, or any of the 47,631 acres under combined hydrocarbon lease conversion application would be located in the designated areas.

For the 2,279,218 acres within the WSAs or portions of WSAs not designated wilderness, 2,182,590 acres would be open to future mineral location, while 96,628 acres would remain closed to mining claim location by current withdrawals. Development work, extraction, and patenting of 3,670 mining claims (73,400 acres) and future mining claims could occur without wilderness consideration, provided they are valid. About 197,999 acres in 277 existing pre- and post-FLPMA oil and gas leases in 38 WSAs and 76,038 acres in 67 existing coal leases in seven WSAs could be developed without wilderness considerations. Four coal preference right lease applications covering 22,964 acres of the Death Ridge WSA could be approved. Approximately 47,631 acres of existing oil and gas leases under conversion application in four WSAs could be converted to combined hydrocarbon leases, consistent with BLM land use plans and leasing category system for tar sand development without nonimpairment considerations. Interim wilderness protection provisions would be eliminated at the conclusion of the wilderness review process. The 2,279,218 acres not designated would be managed as oil and gas leasing Category 1 (standard stipulations) on 1,306,833 acres; Category 2 (standard and special stipulations) on 605,473 acres; Category 3 (no surface occupancy) on 196,097 acres; and Category 4 (closed to leasing) on 170,815 acres.

Domestic livestock grazing would continue to occur in the 956,616 acres of wilderness. The 21,918 Animal Unit Months (AUMs) in the designated areas would remain available to livestock as presently allotted and as determined by forage conditions. The existing developments for livestock could be used and maintained as in the past based on practical necessity and reasonableness. Proposed new rangeland projects (including 2.5 miles of pipeline, one well, 7.5 miles of fence, and six spring or seep improvements to enhance livestock distribution) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. Because of major impacts to wilderness values, 1,660 acres of proposed vegetation treatment and seven livestock reservoirs would not be allowed in designated areas.

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On the 2,279,218 acres of nonwilderness, grazing use of 73,427 AUMs would continue in accordance with applicable BLM lands use plans, and proposed new rangeland developments (including 14,599 acres of vegetation treatment to produce 3,018 AUMs [including AUMs from livestock, wildlife, and watershed treatments], one stock tank, six water catchments, 29 miles of pipeline, five wells, 28.5 miles of fence, 45 spring or seep projects, and 47 livestock reservoirs) could be allowed in these areas without concern for wilderness management.

In the nondesignated areas, water resource facilities would be allowed if consistent with BLM land use plans, including about 1,400 acres of vegetation treatments for watershed improvement, two proposed municipal water developments, and placement of several in-stream structures in four WSAs.

In the 956,616 acres of wilderness, about 2,500 acres of proposed vegetation treatments for wildlife and one proposed wildlife reservoir would not be allowed. In the designated area, three guzzlers and five springs could be developed in conformance with wilderness protection criteria. In the remaining 2,279,218 acres of nonwilderness, about 8,050 acres of vegetation treatments, 17 water catchments, 15 guzzlers, and eight springs could be developed without concern for wilderness management.

The 956,616 acres would be closed to ORV use. About 97.5 miles of existing open ways and trails would not be available for vehicle use except for: (1) those users with valid existing rights, if approved by BLM in accordance with 43 CFR 8560 provisions; (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments; or (3) necessary and reasonable access to private and State in-holdings. The 2,279,218 nondesignated WSA acres, including 504.3 miles of existing open ways, would remain available to vehicular travel in accordance with BLM land use plans. These areas would be managed as open to ORVs on 1,906,092 acres, while use would be limited to existing roads and trails on 239,315 acres, and 133,811 acres would be closed to ORV use.

All of the 956,616 acres in the designated wilderness areas would be closed to commercial woodland harvest. Also, about 157,184 acres in the nondesignated areas would remain closed to harvest while the remaining areas within the nondesignated WSAs would be open to woodland harvest, with specific harvest locations as determined annually by BLM.

All of the 956,616 acres of designated wilderness would be managed as VRM Class I. The 2,279,218 acres in the undesignated areas would be managed as: Class I (allow only natural ecological change) on 17,355 acres; Class II (changes not visually evident) on 1,130,622 acres; Class III (changes evident, but visually subordinate to the dominant landscape) on 282,703 acres; and Class IV (changes evident, but integrated where possible) on 848,538 acres.

With this alternative, 178,866 acres of existing Primitive Areas, ONAs, and ACECs in six WSAs would be in the designated wilderness. About 35,550 acres of these existing administrative designations in six WSAs would be in nonwilderness areas.

In 12 of the designated areas, a total of 133,978.3 acres of special designations such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., would be reviewed for compatibility with wilderness management and incompatible designations would be revoked.

In the nondesignated WSAs and portions of designated WSAs, a total of 72,862.6 acres of special designations in 45 areas would continue without wilderness considerations and would be reviewed as part of BLM's land use planning process.

Within the 956,616 acres of designated wilderness, 273.7 acres of private land and 56,999.4 acres of State land would occur as in-holdings. Private in-holdings would involve four tracts in two WSAs. State in-holdings would include about 92 scattered sections in 13 WSAs. Because of the current State position and BLM policy relative to private land, it is assumed that in-holdings in wilderness areas would not be acquired (see Chapter 1) and that development activities on State land would require new access within seven wilderness areas.

In the nondesignated WSAs, 3,724.3 acres of private and 126,248.6 acres of State lands could be accessed without concern for wilderness management.

• Action Scenario

It is projected that 54,019 acres of surface disturbance would result in the WSAs in the foreseeable future with implementation of the Regional Representative Areas Alternative (see Table 16, Appendix 6, and Appendix 10).

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A total of approximately 279 acres of surface disturbance would occur in 10 of the 14 designated wilderness areas. Approximately 158 acres of the disturbance would occur in nine wilderness areas due to mineral activities, including development of existing valid mining claims and oil and gas exploration and development on pre-FLPMA leases or unitized leases held by production. It is projected that a total of 102 acres of designated wilderness would be disturbed in seven wilderness areas for provision of access to in-held State lands. Approximately 19 acres in five wilderness areas would be disturbed for development of allowable projects for livestock, wildlife, and watershed purposes.

Approximately 53,740 acres of surface disturbance is projected to occur in the 69 nondesignated WSAs and the nondesignated portions of eight WSAs. Of this disturbance, about 28,378 acres would be disturbed in 40 nondesignated areas by mineral exploration and development activities. About 25,925 acres of the mineral-related disturbance would result from coal and tar sand development in 12 WSAs in the long-term future. A projected 224 acres of disturbance would result in 25 nondesignated areas for provision of access to State lands.

A total of 24,228 acres of disturbance would occur in 35 nondesignated areas due to development of projects and vegetation treatments for livestock, wildlife, and watershed purposes, while 910 acres of disturbance would occur in eight nondesignated areas as a result of community expansion, campground construction, development of rights-of-way, and reconstruction of a community water well and a water pipeline.

Paramount Wilderness Quality Alternative

This alternative reflects those areas judged by BLM to be of highest wilderness quality. Where possible, it has been tailored to avoid conflicts between wilderness and other resources; however, in several WSAs where wilderness values have high priority, conflicts would be resolved in favor of wilderness designation. The WSA areas which comprise this alternative are listed on Table 19 and shown on Pocket Map 6. This alternative would include all or parts of 32 WSAs.

With this alternative, 1,533,030 acres of Federal land would be designated as wilderness and would be managed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560). The remaining 1,702,804 acres within the WSAs but not designated as wilderness would be managed generally as described for the No Action/No Wilderness Alternative.

Table 19
WSAs Included in the Paramount Wilderness Quality Alternative

Map Reference Number	WSA Name	Acres
1	North Stansbury Mountains (P)	8,700
3	Deep Creek Mountains (P)	57,384
9	Notch Peak (P)(L)	28,000
11	Wah Wah Mountains (P)	36,382
19	Parunuweap Canyon (P)(L)	17,888
20	Canaan Mountain (P)	33,800
24	Paria-Hackberry (P)	59,670
29	Phipps-Death Hollow (P)	39,256
30	Steep Creek (P)	20,806
31	North Escalante Canyons/The Gulch (P)(L)	91,558
33	Scorpion (P)	14,978
35	Fifty Mile Mountain (P)(S)	51,540
36	Mt. Ellen-Blue Hills (P)	65,804
38	Dirty Devil	61,000
44	Little Rockies	38,700
45	Mancos Mesa (P)	46,120
46	Grand Gulch Complex	105,520
47	Road Canyon (P)(L)	45,720
48	Fish Creek Canyon (P)	40,160
51	Dark Canyon	68,030
52	Butler Wash	24,190
55	Behind the Rocks	12,635
58	Horseshoe Canyon (North)	20,500
59	San Rafael Reef	59,170
60	Crack Canyon	25,335
61	Muddy Creek	31,400
63	Sids Mountain/Sids Cabin (P)	80,084
64	Mexican Mountain (P)	46,750
66	Desolation Canyon (P)(L)	224,850
67	Turtle Canyon (P)	27,960
68	Floy Canyon (P)	23,140
72	Westwater Canyon (P)	26,000
Total		1,533,030

Source: WSA Analyses; Pocket Map 6.

(P) Denotes Partial Wilderness Alternative for individual WSA.

(L) Indicates larger of two Partial Wilderness Alternatives analyzed for the WSA.

(S) Indicates smaller of two Partial Wilderness Alternatives analyzed for the WSA.

• Management Conditions and Constraints

The 1,533,030 acres of wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sales. In the wilderness areas, development work, extraction, and patenting would be allowed to continue on 2,977 existing mining claims (59,540 acres), provided they are valid. After designation, 155 existing pre- and post-FLPMA oil and gas leases, involving 110,082 acres, would be phased out on expiration un-

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less an oil or gas find in commercial quantities is shown. The 8,554 acres of existing pre-FLPMA leases or leases currently held by production or within unit agreements could be developed in the designated areas with impairment to wilderness values. The remaining 101,528 acres in 135 existing post-FLPMA leases would continue to be subject to nonimpairment provisions.

None of the 47,631 acres under lease conversion application would be located in the designated areas. It addition, none of the 76,038 acres in existing coal leases or the four preference right lease applications in the Death Ridge WSA would be located in the designated areas.

For the 1,702,804 acres within the WSAs or portions of WSAs not designated wilderness, 1,621,228 acres would be open to future mineral location, while 81,576 acres would remain closed to mining claim location by current withdrawals. In the undesignated areas, development work, extraction, and patenting of 2,550 mining claims (51,000 acres) and future mining claims could occur without wilderness consideration, provided they are valid. About 154,820 acres in 190 existing oil and gas leases and 76,038 acres in 64 existing coal leases could be developed without wilderness considerations. The four coal preference right lease applications that cover 22,964 acres of the Death Ridge WSA could be approved. About 47,631 acres in existing oil and gas leases under application for conversion in four WSAs could be converted to combined hydrocarbon leases, consistent with BLM land use plans and leasing category system for tar sand development without nonimpairment considerations. Interim wilderness protection provisions would be eliminated at the conclusion of the wilderness review process. The 1,702,804 acres not designated would be managed as: oil and gas leasing Category 1 (standard stipulations) on 1,131,513 acres; Category 2 (standard and special stipulations) on 431,493 acres; Category 3 (no surface occupancy) on 105,501 acres; and Category 4 (closed to leasing) on 34,297 acres.

Domestic livestock grazing would continue to occur on the 1,533,030 acres of wilderness. The 39,724 AUMs in the designated areas would remain available to livestock as presently allotted and as determined by forage conditions. The existing developments for livestock could be used and maintained as in the past based on practical necessity and reasonableness. Proposed new rangeland projects (including two water catchments, 10.5 miles of pipeline, one well, 1 mile of fence, one stock tank, one water storage tank, and nine spring or

seep improvements to enhance livestock distribution) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. Because of major impacts to wilderness values, 6,160 acres of proposed vegetation treatment and 15 livestock reservoirs would not be allowed in designated areas.

For the 1,702,804 acres of nonwilderness, grazing use would continue in accordance with applicable BLM lands use plans, and proposed new rangeland developments (including 10,999 acres of vegetation treatment to produce 2,542 AUMs [including AUMs from livestock, wildlife, and watershed treatments], four water catchments, 21.7 miles of pipeline, five wells, 35 miles of fence, 42 spring or seep projects, and 39 livestock reservoirs) could be allowed in these areas without concern for wilderness management.

On the 1,533,030 acres of wilderness, about 1,000 acres of vegetation treatment for watershed purposes on one WSA would not be allowed. In the nondesignated areas of the WSAs, water resource facilities would be allowed if consistent with BLM land use plans, including about 400 acres of land treatments for watershed improvement, two municipal water developments, and several instream structures in four WSAs.

On the 1,533,030 acres of wilderness, about 2,000 acres of proposed vegetation treatment for wildlife and one proposed wildlife reservoir would not be allowed. In the designated areas one catchment, five guzzlers, and 10 springs could be developed consistent with wilderness protection criteria. On the remaining 1,702,804 acres of non-wilderness, about 8,550 acres of vegetation treatments, three spring developments, 16 catchments, and 13 guzzlers could be developed for wildlife without concern for wilderness management.

The 1,533,030 acres would be closed to ORV use. About 124.2 miles of existing open ways and trails would not be available for vehicle use except for: (1) those users with valid existing rights, if approved by BLM in accordance with 43 CFR 8560 provisions; (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments; or (3) necessary and reasonable access to private and State in-holdings. The 1,702,804 acres in the nondesignated WSAs, including 477.6 miles of existing ways, would remain available to vehicular travel in accordance with BLM land use plans. About 1,566,716 acres of the nondesignated areas would be open to ORV use, while vehicle use would be limited to existing

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roads and trails on 122,155 acres and 13,933 acres would be closed to ORV use.

All of the 1,533,030 acres in the designated wilderness areas would be closed to commercial woodland harvest. Also, about 35,734 acres in the nondesignated areas would remain closed to harvest while the remaining areas within the nondesignated portions of the WSAs would be open to woodland harvest, with specific locations determined annually by BLM.

All of the 1,533,030 acres of designated wilderness would be managed as VRM Class I. The 1,702,804 acres in the undesignated areas would be managed as: Class I (allow only natural ecological change) on 3,955 acres; Class II (changes not visually evident) on 719,224 acres; Class III (changes evident, but visually subordinate to the dominant landscape) on 224,473 acres; and Class IV (changes evident, but integrated where possible) on 755,152 acres.

With this alternative, 204,721 acres of existing Primitive Areas, ONAs, and ACECs in nine WSAs would be in the designated wilderness. About 9,695 acres of these existing administrative designations in three WSAs would be in nonwilderness areas.

In 26 of the designated areas, a total of 155,714.8 acres of special designations, such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., would be reviewed for compatibility with wilderness management and incompatible designations would be revoked.

In the nondesignated WSAs and portions of WSAs, a total of 51,126.1 acres of special designations in 36 areas would continue without wilderness considerations and would be reviewed as part of BLM's land use planning process.

Within the 1,533,030 acres of designated wilderness, 273.7 acres of private land and 84,771.3 acres of State land would occur as in-holdings. Private in-holdings would involve four tracts in two WSAs. State in-holdings would include about 138 scattered sections in 27 WSAs. Because of the current State position and BLM policy relative to private land, it is assumed that in-holdings in wilderness areas would not be acquired (see Chapter 1) and that development activities on State lands would require new access in 15 wilderness areas.

In the nondesignated WSA areas, 12 private (3,724.3 acres) and 156 State (98,476.7 acres) in-holdings could be accessed without concern for wilderness management.

• Action Scenario

It is projected that 48,470 acres of surface disturbance would result in the WSAs in the foreseeable future with implementation of the Paramount Wilderness Alternative (see Table 16, Appendix 6, and Appendix 10).

A total of approximately 413 acres of surface disturbance would occur in 24 of the 32 designated wilderness areas. Approximately 229 acres of the disturbance would occur in 16 wilderness areas due to mineral activities, including development of existing valid mining claims and oil and gas exploration and development on pre-FLPMA leases or unitized leases held by production. It is projected that a total of 143 acres of designated wilderness would be disturbed in 15 wilderness areas for provision of access to in-held State lands. Approximately 41 acres in 11 wilderness areas would be disturbed for development of allowable projects for livestock, wildlife, and watershed purposes.

Approximately 48,057 acres of surface disturbance is projected to occur in the 51 nondesignated WSAs and the nondesignated portions of 22 WSAs. Of this disturbance, about 27,694 acres would be disturbed in 34 nondesignated areas by mineral exploration and development activities. About 25,925 acres of the mineral-related disturbance would result from coal and tar sand development in 12 WSAs in the long-term future. A projected 183 acres of disturbance would result in 19 nondesignated areas for provision of access to State lands.

A total of 19,504 acres of disturbance would occur in 31 nondesignated areas due to development of projects and land treatments for livestock, wildlife, and watershed purposes, while 676 acres of disturbance would occur in seven nondesignated areas as a result of community expansion, campground construction, development of rights-of-way, and reconstruction of a community water well and a water pipeline.

Cluster and Interagency Areas Alternative

This alternative identifies all BLM WSAs regardless of size that are adjacent to other Federal agency lands, Indian lands, or State lands that: (1) have been designated wilderness, (2) are proposed by the managing

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agency for wilderness designation, or (3) are managed as roadless.

This alternative also identifies all BLM WSAs that by themselves or when considered in conjunction with contiguous WSAs (separated by nothing greater than dirt roads or minor intrusions) are approximately 60,000 acres or more in size.

One purpose of this alternative is to identify lands contiguous to BLM WSAs that fit with the concept of clusters or groups of closely associated wilderness areas.

A second purpose is to indicate where the wilderness values of adjacent lands may be enhanced or complemented by wilderness designation of BLM WSAs.

The third purpose is to identify and analyze how tourism, including commercial enterprises, and opportunities for primitive and unconfined recreation use might be affected where BLM WSAs involve joint agency wilderness management and/or are large enough to support extended use periods (such as long hikes with camps enroute).

The individual WSA acreages included in this alternative are shown on Table 10. The WSAs and the adjacent other agency wilderness lands are listed on Table 20 and shown on Pocket Map 7. This alternative would include 53 WSAs, including 15 studied under Section 202 of FLPMA that would be suitable only in conjunction with adjacent National Park areas.

Table 20
WSAs and Adjacent Agency Lands Included
in the Cluster and Interagency Alternative

Map Reference Number	Units	Acres
WSAs		
1	North Stansbury Mountains	10,480
3	Deep Creek Mountains	68,910
10	King Top	84,770
15	LaVerkin Creek	567
16	Deep Creek	3,320
17	North Fork Virgin River	1,040
18	Orderville Canyon	1,750
19	Parunuweap Canyon	30,800
20	Canaan Mountain	47,170
24	Paria-Hackberry/Paria Hackberry 202	136,222
25	Cockscomb	10,080
26	Wahweap	134,400
27	Burning Hills	61,550
28	Death Ridge	62,870
29	Phipps-Death Hollow	42,731
31	North Escalante Canyons/The Gulch	119,752
33	Scorpion	35,884

Table 20 (Continued)
WSAs and Adjacent Agency Lands Included
in the Cluster and Interagency Alternative

Map Reference Number	Units	Acres
WSAs		
34	Escalante Canyon Tract 5	760
35	Fifty Mile Mountain	146,143
36	Mt. Ellen-Blue Hills	81,726
38	Dirty Devil	61,000
39	Horseshoe Canyon (South)	38,800
41	Fiddler Butte	73,100
42	Mt. Pennell	74,300
45	Mancos Mesa	51,440
46	Grand Gulch	105,520
47	Road Canyon	52,420
48	Fish Creek Canyon	46,440
51	Dark Canyon	68,030
52	Butler Wash	24,190
54	Indian Creek	6,870
58	Horseshoe Canyon (North)	20,500
59	San Rafael Reef	59,170
63	Sids Mountain/Sids Cabin	80,970
64	Mexican Mountain	59,600
65	Jack Canyon	7,500
66	Desolation Canyon	290,845
67	Turtle Canyon	33,690
68	Floy Canyon	72,605
69	Coal Canyon	61,430
70	Spruce Canyon	20,350
71	Flume Canyon	50,800
72	Westwater Canyon	31,160
A	Red Butte	804
B	Spring Creek Canyon	4,433
C	The Watchman	600
D	Taylor Creek Canyon	35
E	Goose Creek Canyon	89
F	Beartrap Canyon	40
G	Fremont Gorge	2,540
H	Lost Spring Canyon	3,880
I	Daniels Canyon	2,496
J	South Needles	160
Total (53 WSAs)		2,486,732
National Park Service		
	Dinosaur National Monument	39,684
	Glen Canyon NRA	576,975
	Zion National Park	120,620
	Arches National Park	62,947
	Capitol Reef National Park	179,815
	Canyonlands National Park	287,133
Total (6 NPS)		1,267,174
Forest Service		
	Dark-Woodenshoe Canyon	45,000
	Box-Death Hollow	26,000
	Deseret Peak	25,000
Total (3 FS)		96,500
State Land		
	Book Cliffs	56,800
Total (1 State)		56,800
Indian Land		
	Hill Creek	413,000
Total (1 Indian)		413,000
Grand Total		4,320,000

Source: BLM File Data.

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With this alternative, 2,486,732 acres of BLM-administered Federal land would be designated as wilderness and would be managed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560). The remaining 749,102 acres within the WSAs but not designated as wilderness would be managed generally as described for the No Action/No Wilderness Alternative.

• Management Conditions and Constraints

The 2,486,732 acres of wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sales. In the wilderness areas, development work, extraction, and patenting would be allowed to continue on 3,107 existing mining claims (62,140 acres), provided they are valid. After designation, 258 existing pre- and post-FLPMA oil and gas leases, involving 198,383 acres, would be phased out on expiration unless an oil or gas find in commercial quantities is shown. The 49,878 acres in 64 existing pre-FLPMA leases and leases currently held by production or within unit agreements could be developed in the designated areas with impairment to wilderness values. The remaining 148,505 acres in 194 existing post-FLPMA leases would continue to be subject to nonimpairment provisions.

Approximately 35,043 acres in 22 leases under conversion application in two WSAs would be located in the designated areas. Since it would be very difficult for tar sand development to meet nonimpairment requirements, for this alternative it is projected that no tar sand exploration or development would occur in designated wilderness areas.

About 57,474 acres in 54 coal leases in the designated areas (five WSAs) would expire and would not be reissued unless diligent development requirements are met prior to expiration. Four preference right lease applications covering 22,964 acres of the Death Ridge WSA would not be approved.

For the 749,102 acres within the WSAs not designated wilderness, 682,040 acres would be open to future mineral location, while 67,062 acres would remain closed to mining claim location by current withdrawals. In the undesignated areas, development work, extraction, and patenting of 2,420 mining claims (48,400 acres) and future mining claims could occur without wilderness consideration, provided they are valid. About 66,519 acres in 87 existing oil and gas leases in 31 WSAs and 18,564 acres in 10 existing coal leases in two WSAs could be developed without wilderness consideration. About 12,588 acres of existing oil and gas leases under

conversion application in two WSAs could be converted to combined hydrocarbon leases, consistent with BLM land use plans and leasing category system for tar sand development, without nonimpairment considerations. Interim wilderness protection provisions would be eliminated at the conclusion of the wilderness review process. The 749,102 acres not designated would be managed as oil and gas leasing: Category 1 (standard stipulations) on 437,473 acres; Category 2 (standard and special stipulations) on 144,749 acres; Category 3 (no surface occupancy) on 84,419 acres; and Category 4 (closed to leasing) on 82,461 acres.

Domestic livestock grazing would continue to occur in the 2,486,732 acres of wilderness. The 68,860 AUMs in the designated areas would remain available to livestock as presently allotted and as determined by forage conditions. The existing developments for livestock could be used and maintained as in the past based on practical necessity and reasonableness. Proposed new rangeland projects (including six water catchments, 30.7 miles of pipeline, one water storage tank, six wells, 24.5 miles of fence, and 35 spring or seep improvements to enhance livestock distribution) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. Because of major impacts to wilderness values, 14,259 acres of vegetation treatment and 41 livestock reservoirs would not be allowed in designated areas.

For the 749,102 acres of nonwilderness, grazing use of 26,845 AUMs would continue in accordance with applicable BLM lands use plans, and proposed new rangeland developments (including 2,000 acres of vegetation treatment to produce 297 AUMs, which includes AUMs from livestock, wildlife, and watershed treatments, 1.5 miles of pipeline, 11.5 miles of fence, 16 spring or seep projects, and 13 livestock reservoirs) could be allowed in these areas without concern for wilderness management.

On the 2,486,732 acres of wilderness, about 1,000 acres of vegetation treatment for watershed purposes (one WSA) and one municipal water development would not be allowed. In the nondesignated areas of the WSAs, water resource facilities would be allowed if consistent with BLM land use plans, including about 400 acres of vegetation treatments for watershed improvement and several instream structures in four WSAs.

On the 2,486,732 acres of wilderness, about 9,450 acres of vegetation treatment for wildlife and one proposed wildlife reservoir would not be allowed. In the designated areas, 10 guzzlers, 17 catchments, and 10

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springs could be developed for wildlife consistent with wilderness protection criteria. On the remaining 749,102 acres of nonwilderness, about 1,100 acres of land treatments, eight guzzlers, and three spring developments could be carried out for wildlife without concern for wilderness management.

The 2,486,732 acres would be closed to ORV use. About 453.7 miles of existing open ways and trails would not be available for vehicle use except for: (1) those users with valid existing rights, if approved by BLM in accordance with 43 CFR 8560 provisions; (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments; or (3) necessary and reasonable access to private and State in-holdings. The 749,102 nondesignated WSA acres, including 148.1 miles of existing open ways, would remain available to vehicular travel in accordance with BLM land use plans. Approximately 598,377 acres of the nondesignated areas would be open to ORV use while vehicles would be limited to existing roads and trails on 67,590 acres and 83,135 acres would be closed to ORV use.

All of the 2,486,732 acres in the designated wilderness areas would be closed to commercial woodland harvest. Also, about 121,323 acres in the nondesignated areas would remain closed to harvest while the remaining areas within the nondesignated WSAs would be open to woodland harvest, with specific available locations determined annually by BLM.

All of the 2,486,732 acres of designated wilderness would be managed as VRM Class I. The 749,102 acres in undesignated areas would be managed as: Class II (changes not visually evident) on 328,343 acres; Class III (changes evident, but visually subordinate to the dominant landscape) on 112,102 acres; and Class IV (changes evident, but integrated where possible) on 308,657 acres.

With this alternative, 189,591 acres of existing Primitive Areas, ONAs, and ACECs in eight WSAs would be in the designated wilderness. About 24,825 acres of these existing administrative designations in four WSAs would be in nonwilderness areas. In 34 of the designated areas, a total of 188,795.5 acres of special designations, such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., would be reviewed for compatibility with wilderness management and incompatible designations would be revoked.

In the nondesignated WSAs and portions of WSAs, a total of 18,045.4 acres of special designations in 17 areas would continue without wilderness considerations and would be reviewed as part of BLM's land use planning process.

Within the 2,486,732 acres of designated wilderness, 613.7 acres of private land and 150,795 acres of State land would occur as in-holdings. Private in-holdings would involve eight tracts in five WSAs. State in-holdings would include about 243 scattered sections in 34 WSAs. Because of the current State position and BLM policy relative to private land, it is assumed that in-holdings in wilderness areas would not be acquired (see Chapter 1) and that development activities involving certain of the holdings would require new access in 22 wilderness areas.

In the nondesignated WSA areas, eight private (3,384 acres) and 51 State in-holdings (32,452.6 acres) could be accessed without concern for wilderness management.

• Action Scenario

It is projected that 13,395 acres of surface disturbance would result in the WSAs in the foreseeable future with implementation of the Cluster and Interagency Alternative (see Table 16, Appendix 6, and Appendix 10).

A total of approximately 807 acres of surface disturbance would occur in 32 of the 53 designated wilderness areas. Approximately 364 acres of the disturbance would occur in 19 wilderness areas due to mineral activities, including development of existing valid mining claims and oil and gas exploration and development on pre-FLPMA leases or unitized leases held by production. It is projected that a total of 302 acres of designated wilderness would be disturbed in 22 wilderness areas for provision of access to in-held State lands. Approximately 116 acres in 22 wilderness areas would be disturbed for development of allowable projects for livestock, wildlife, and watershed purposes. Twenty-five acres in one WSA would be disturbed by development of an existing right-of-way.

Approximately 12,588 acres of surface disturbance is projected to occur in the 30 nondesignated WSAs. Of this disturbance, about 8,375 acres would be disturbed in 17 nondesignated areas by mineral exploration and development activities. About 7,635 acres of the mineral-related disturbance would result from coal and tar sand development in five WSAs in the long-term future. A

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projected 24 acres of disturbance would result in nine nondesignated areas for provision of access to State lands.

A total of 3,539 acres of disturbance would occur in 12 nondesignated WSAs due to development of projects and land treatments for livestock, wildlife, and watershed purposes, while 650 acres of disturbance would occur in five nondesignated areas as a result of community expansion, campground construction, development of rights-of-way, and reconstruction of a community water well.

All Wilderness Alternative

This alternative would include all of the WSAs, including 15 areas studied under Section 202 of FLPMA that would be suitable only in conjunction with adjacent National Park areas.

The WSAs included are shown on Table 21 and Pocket Map 8. With this alternative, all of the WSAs, totalling 3,235,834 acres of Federal land, would be designated as wilderness and would be managed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560).

• Management Conditions and Constraints

The 3,235,834 acres of wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sales. In the wilderness, development work, extraction, and patenting would be allowed to continue on 5,527 existing mining claims (110,540 acres), provided they are valid. After designation, 345 existing pre- and post-FLPMA oil and gas leases, involving 264,902 acres, would be phased out on expiration unless an oil or gas find in commercial quantities is shown. The 65,479 acres of existing pre-FLPMA leases and leases currently held by production or within unit agreements could be developed in the designated areas with impairment to wilderness values. The existing post-FLPMA leases (199,423 acres) would continue to be subject to nonimpairment provisions.

Because it would be very difficult for tar sand development to meet nonimpairment requirements, for this alternative it is assumed that the 47,631 acres in 37 leases under combined hydrocarbon conversion application would not be developed.

Table 21
WSAs Included in the All Wilderness Alternative

Map Reference Number/ Letter	WSA Name	Acres
1	North Stansbury Mountains	10,480
2	Cedar Mountains	50,500
3	Deep Creek Mountains	68,910
4	Fish Springs	52,500
5	Rockwell	9,150
6	Swasey Mountain	49,500
7	Howell Peak	24,800
8	Conger Mountain	20,400
9	Notch Peak	51,130
10	King Top	84,770
11	Wah Wah Mountains	42,140
12	Cougar Canyon	15,968
13	Red Mountain	18,290
14	Cottonwood Canyon	11,330 ^a
15	LaVerkin Creek Canyon	567 ^a
16	Deep Creek	3,320 ^a
17	North Fork Virgin River	1,040 ^a
18	Orderville Canyon	1,750 ^a
19	Parunuweap Canyon	30,800
20	Canaan Mountain	47,140
21	Moquith Mountain	14,830
22	The Blues	19,030
23	Mud Spring Canyon	38,075
24	Paria-Hackberry	136,222
25	The Cockscomb	10,080
26	Wahweap	134,400
27	Burning Hills	61,550
28	Death Ridge	62,870
29	Phipps-Death Hollow	42,731
30	Steep Creek	21,896
31	North Escalante Canyons/The Gulch ISA	119,752
32	Carcass Canyon	46,711
33	Scorpion	35,884
34	Escalante Canyons Tract 5 ISA	760
35	Fifty Mile Mountain	146,143
36	Mt. Ellen-Blue Hills	81,726
37	Bull Mountain	13,620
38	Dirty Devil	61,000
39	Horseshoe Canyon (South)	38,800
40	French Spring-Happy Canyon	25,000
41	Fiddler Butte	73,100
42	Mt. Pennell	74,300
43	Mt. Hillers	20,000
44	Little Rockies	38,700
45	Mancos Mesa	51,440
46	Grand Gulch ISA Complex	105,520
47	Road Canyon	52,420
48	Fish Creek Canyon	46,440
49	Mule Canyon	5,990
50	Cheesebox Canyon	15,410
51	Dark Canyon ISA Complex	68,030
52	Butler Wash	24,190
53	Bridger Jack Mesa	5,290
54	Indian Creek	6,870
55	Behind the Rocks	12,635
56	Mill Creek Canyon	9,780
57	Negro Bill Canyon	7,620
58	Horseshoe Canyon (North)	20,500

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Table 21 (Continued)
WSAs Included in the All Wilderness Alternative

Map Reference Number/ Letter	WSA Name	Acres
59	San Rafael Reef	59,170
60	Crack Canyon	25,335
61	Muddy Creek	31,400
62	Devils Canyon	9,610
63	Sids Mountain/Sids Cabin	80,970
64	Mexican Mountain	59,600
65	Jack Canyon	7,500
66	Desolation Canyon	290,845
67	Turtle Canyon	33,690
68	Floy Canyon	72,605
69	Coal Canyon	61,430
70	Spruce Canyon	20,350
71	Flume Canyon	50,800
72	Westwater Canyon	31,160
73	Winter Ridge	42,462
A	Red Butte	804 ^a
B	Spring Creek Canyon	4,433 ^a
C	The Watchman	600 ^a
D	Taylor Creek Canyon	35 ^a
E	Goose Creek Canyon	89 ^a
F	Beartrap Canyon	40 ^a
G	Fremont Gorge	2,540 ^a
H	Lost Spring Canyon	3,880 ^a
I	Daniels Canyon	2,496 ^a
J	South Needles	160 ^a
Total		3,235,834

Source: WSA Analyses; Pocket Map 1.

^aProposed only in conjunction with adjacent national park lands.

About 76,038 acres of coal leases in seven WSAs would expire and would not be re-issued unless diligent development requirements are met prior to expiration. Four coal preference right lease applications that cover 22,964 acres in the Death Ridge WSA could not be approved. No areas in the WSAs would be open to future mineral location or leasing.

Domestic livestock grazing would continue to occur in the 3,235,834 acres of wilderness. The 95,345 AUMs in the designated areas would remain available to livestock as presently allotted and as determined by forage conditions. The existing developments for livestock could be used and maintained as in the past based on practical necessity and reasonableness. Proposed new rangeland projects (including six water catchments, 32.2 miles of pipeline, one water storage tank, six wells, 36 miles of fence, and 51 spring or seep improvements to enhance livestock distribution) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. Because of major impacts to wilderness values, 16,259 acres of proposed vegetation treatment and 54

livestock reservoirs would not be allowed in designated areas.

On the 3,235,834 acres of wilderness, about 1,400 acres of vegetation treatment for watershed purposes (two WSAs) and two proposed municipal water developments would not be allowed.

On the 3,235,834 acres of wilderness, about 10,550 acres of vegetation treatment for wildlife and one reservoir would not be allowed. It is assumed that the proposed wildlife developments, including 17 catchments, 18 guzzlers, and 13 springs, could be developed in conformance with wilderness protection criteria.

The 3,235,834 acres would be closed to ORV use. About 601.8 miles of open ways and trails would not be available for vehicle use except for: (1) those users with valid existing rights, if approved by BLM in accordance with 43 CFR 8560 provisions; (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments; or (3) necessary and reasonable access to private and State in-holdings.

All of the 3,235,834 acres in the designated wilderness areas would be closed to commercial woodland harvest.

All of the 3,235,834 acres of designated wilderness would be managed as VRM Class I.

With this alternative, 214,416 acres of existing Primitive Areas, ONAs, and ACECs in 12 WSAs would be in the designated wilderness. A total of 206,840.9 acres of special designations such as public water reserves, rights-of-way, material sites, power site classifications, Federal power project withdrawals, oil shale withdrawals, etc., in 51 WSAs would be reviewed for compatibility with wilderness management and incompatible designations would be cleared from the wilderness areas.

Within the 3,235,834 acres of designated wilderness, 3,998 acres of private land and 183,248 acres of State land would occur as in-holdings. Private in-holdings would involve 16 tracts in eight WSAs. State in-holdings would include about 294 scattered sections in 52 WSAs. Because of the current State position and BLM policy relative to private land, it is assumed that in-holdings in wilderness areas would not be acquired (see Chapter 1) and that development activities would require new access in 30 wilderness areas.

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- Action Scenario

It is projected that 1,017 acres of surface disturbance would result in the wilderness areas in the foreseeable future with implementation of the All Wilderness Alternative (see Table 16, Appendix 6, and Appendix 10).

Approximately 503 acres of the disturbance would occur in 31 wilderness areas due to mineral activities, including development of existing valid mining claims and oil and gas exploration and development on pre-FLPMA leases or unitized leases held by production. It is projected that a total of 326 acres of designated wilderness would be disturbed in 30 wilderness areas for provision of access to in-held State lands. Approximately 138 acres in 32 wilderness areas would be disturbed for development of allowable projects for livestock, wildlife, and watershed purposes. A total of 50 acres in two WSAs would be disturbed by development of an existing rights-of-way.

MANAGEMENT ASSUMPTIONS COMMON TO ALL STATEWIDE ALTERNATIVES TO BE ANALYZED IN DETAIL

The following assumptions and guidelines are applicable to the Statewide alternatives analyzed in the Final EIS.

- The alternatives would be carried out as cited in the Description of the Alternatives section.
- Development potential has been divided into short-term and long-term projections. The short-term is defined as that time from the present to the year 2020. The long-term is defined as beyond the year 2020. The term "foreseeable future" refers to both the short and long term in reference to activities that are predicted to occur in a WSA.
- Within the short term, the quality of data varies. From the present to about the year 2005, there are relatively good data with which to make development projections. From the year 2005 to the year 2020, very limited, or little, data exists. Long-term projections are based on very general indications and are more uncertain.
- Although the degree of future development cannot be predicted with assurance, reasonably foreseeable Action Scenarios are presented in the description of the alternatives portion of the EIS for analysis purposes. Based on known plans and proposals, known and estimated resource values, and projections of future conditions, BLM believes the Action Scenarios describe rea-

sonable activities likely to occur in the WSAs over the foreseeable future, if the various alternatives are implemented.

- Mineral evaluations and estimates of in-place mineral reserves are based on a mineral resource evaluation of the WSAs by the Science Applications, Incorporated (SAI), the U.S. Geological Survey (USGS), and Bureau of Mines (USBM) Mineral Survey Reports (where available), and subsequent detailed evaluations by the BLM minerals staff. The estimates generally are based on literature studies, known exploration, drilling, and mining activities (including input from energy and mineral organizations). The analysis estimates the potentially recoverable energy and mineral resources and then, using BLM's field experience and judgment, presents the probability of short-term and long-term development. Appendix 6 explains the methodology for mineral exploration and development projections, and Appendix 10 explains the estimates of surface disturbance from projected activities in the WSAs.

- The environmental consequences for each of the Statewide alternatives are presented for the principle Statewide issues identified in Chapter 1.

- For WSAs or portions of WSAs not designated as wilderness, it is assumed that BLM would manage according to the applicable BLM land use planning document, identified in the WSA analysis (Volumes II through VI). The following general management practices would apply to nondesignated areas:

1. Mineral leasing and mineral sales would be allowed in selected areas, according to the provisions of the applicable BLM land use plans. Withdrawals from mineral entry would continue on a case-by-case basis.
2. Water rights would be obtained pursuant to the applicable State statutory and administrative procedure, and current Federal policies for multiple-use purposes. Water resource development projects could be permitted on a case-by-case basis.
3. BLM would establish and maintain land use management practices which assure the protection of water supplies and aquatic habitat from chemical, physical, or biological deterioration as defined by Environmental Protection Agency (EPA) and State water quality standards to protect health of the public and other beneficial uses.
4. Private, commercial, and military aircraft use of airspace would continue as at present.

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5. Prior to authorizing surface-disturbing activities, BLM would consult with the FWS if and as required by provisions of the Endangered Species Act. Appropriate measures would be taken to protect endangered, threatened, or sensitive plant and animal species.

6. Measures to control fire, insects, noxious weeds, or disease would be taken as appropriate, if in conformance with BLM land use plans and guidelines.

7. Wildlife transplants or habitat developments would be allowed if in conformance with BLM land use plans. Projects would be considered for approval on a case-by-case basis.

8. Livestock grazing would be allowed to continue, consistent with applicable BLM land use plans and forage conditions.

9. Visual resources would be managed after consideration of the four VRM classes, in accordance with the applicable BLM land use plans.

10. Cultural resources would be protected by provisions of the Uniform Rules and Regulations (43 CFR Part 3) to carry out the Antiquities Act, the Historic Sites Act, Executive Order 11593, the National Historic Preservation Act, and the Archaeological Resources Protection Act. Cultural resources could be excavated, stabilized, or interpreted without regard for wilderness values.

11. Various areas would be closed to ORV use, limited to existing roads and trails, and open to use in accordance with applicable BLM land use plans.

12. Harvest of forest products would continue to be allowed only in designated areas, consistent with applicable BLM land use plans.

13. Activities for the purpose of gathering information would be allowed by permit provided they are carried out in an environmentally sound manner.

14. Hunting would be allowed subject to applicable State and Federal laws and regulations.

15. Control of predators would be allowed without wilderness considerations and would be conducted according to State law and Animal and Plant Health Inspection Service (APHIS) guidelines. Methods of control would be determined to fit each individual situation.

For each WSA or portions of the WSAs that would be designated as wilderness, it is assumed that BLM would manage according to provisions of the BLM Wilderness Management Policy (BLM Manual 8560; see Appendix 1 in Volume I). The following general measures would apply to designated wilderness areas:

1. All designated areas would be withdrawn from mineral location and closed to new mineral leasing and mineral sales.

2. Existing livestock grazing would continue, consistent with BLM land use plans and forage conditions. New rangeland developments would be allowed on a case-by-case basis if determined to be consistent with wilderness values and if necessary for rangeland and/or wilderness protection and effective management of these resources. Occasional, continued use of motor vehicles, motorized equipment, or mechanical transport may be permitted where practical alternatives are not available.

3. New water resource facilities or watershed activities (not related to rangeland or wildlife management) would be allowed only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(1) of the Wilderness Act (Eighty-Eighth Congress of the U.S., 1964).

4. Water rights necessary for multiple-use management of public lands would be acquired, perfected, and protected, consistent with existing State procedures and Federal policies. It is assumed that there would be no Federal reserved rights implied with or attached to wilderness designation, as described in the Issues Identification section of Chapter 1 (Meese, 1988).

5. BLM would establish and maintain land use management practices which assure the protection of water supplies and aquatic habitat from chemical, physical, or biological deterioration as defined by EPA and State water quality standards to protect the health of the public and other beneficial uses. Management practices would be consistent with the BLM Wilderness Management Guidelines. Salinity control within designated areas would be by prevention of disturbance and by natural watershed processes.

6. Prior to authorizing surface-disturbing activities, BLM would consult with FWS, if and as required by the provisions of the Endangered Species Act. Appropriate measures would be taken to protect endangered, threatened, or sensitive plant and animal species.

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7. Wildlife transplants or habitat developments would be allowed if compatible with wilderness values. Projects would be considered for approval on a case-by-case basis.

8. All areas designated as wilderness would be closed to ORV use except for users with valid existing rights if approved by BLM in accordance with 43 CFR 8560 provisions. Reasonable access to State and private in-holdings would be allowed if needed.

9. Specific wilderness management plans would be prepared to govern use and protection of the wilderness areas. It is assumed that a maintenance and use border would be allowed along roads, including cherry-stems, adjacent to wilderness areas for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be from 100 to 300 feet from the edge of the road travel surface, depending on the nature of the road and the adjacent terrain.

10. Private, commercial, and military aircraft use of airspace over the designated wilderness would continue, but a minimum elevation of 2,000 feet above the ground surface would be encouraged by BLM and the Federal Aviation Administration (FAA).

11. Harvest of forest products would not be allowed in designated areas, except for harvest of pine nuts or noncommercial gathering of dead-and-down wood for campfire use in the wilderness. Harvest would be limited to nonmechanical methods. Vehicular access for harvest of forest products would not be allowed.

12. Cultural resources would be protected with the various antiquities and protection acts noted above. However, in most instances exposed sites would be subjected to the forces of nature, and the study and management generally would not include excavation, stabilization, or interpretation. Exceptions would be allowed on a case-by-case basis with special approval of the BLM State Director.

13. Visual resources would be managed in accordance with Visual VRM Class I standards which generally allow only for natural ecological change.

14. Measures to control fire, insects, noxious weeds, or disease would be taken in designated areas in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken would be those having the least adverse impact to

wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that fire fighting generally would be limited to hand and aerial techniques.

15. Activities for the purpose of gathering information about natural resources would be allowed by permit if carried out in a manner compatible with the preservation of the wilderness resource. Research and other studies would be conducted without use of motorized equipment or structures (temporary or permanent) unless no other feasible alternatives exist.

16. Hunting would be allowed subject to applicable State and Federal laws and regulations, but would be limited to non-motorized access.

17. Where control of predators is necessary to protect endangered or threatened wildlife species, or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns (M-44s) would not be allowed. Approval of a predator control program would be contingent on a clear showing that removal of the offending predators would not diminish the wilderness values of the designated areas.

18. Future users in both designated wilderness and non-designated areas would be required to meet all applicable Federal, State, and local laws and regulations. This would include compliance with required mitigating measures, stipulations, and reclamation procedures.

19. It is assumed that, once designated, wilderness areas would be managed over the long term as part of the National Wilderness Preservation System.

SUMMARY OF IMPACTS FOR STATEWIDE ALTERNATIVES ANALYZED IN DETAIL

Table 22 displays the major environmental consequences for each of the Statewide alternatives analyzed in detail. Impacts for those resources or concerns that are considered by BLM to be the principle Statewide issues are shown in the table in comparable form.

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22
Summary of Impacts Related to Principal Issues

Alternatives			Regional Representative Areas (956,616 Acres)
Resource	BLM Proposed Action (1,975,219 Acres)	No Action/No Wilderness	
Impacts on Wilderness Values	<p>Wilderness values would be preserved overall in the designated areas which comprise about 61 percent of the total acreage in the 83 WSAs. Wilderness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 41,248 acres. The loss would be due to mineral-related activities, provision of access to in-held State lands, development of rangeland projects, ORV activity, community expansion, campground construction, and development of rights-of-way. About 99 percent of the loss would be in nondesignated areas. Opportunities for solitude and primitive and unconfined recreation would be directly lost due to disturbance as described above for naturalness. In addition, opportunities for solitude and primitive and unconfined recreation would be directly lost due to disturbance as described above for solitude and future development and future recreational use, particularly use involving vehicles. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. With this alternative, approximately 80 percent of the special features found in the 83 WSAs would be protected by wilderness designation.</p>	<p>Wilderness values would not be protected by wilderness designation in any WSA, and loss would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 58,968 acres. The loss would be due to mineral-related activities, provision of access to in-held State lands, development of rangeland projects, ORV activity, community expansion, campground construction, and development of rights-of-way. Opportunities for solitude and primitive and unconfined recreation would also be directly lost due to disturbance as described above for naturalness. In addition, opportunities for solitude and primitive and unconfined recreation would be directly lost due to disturbance as described above for solitude and future development and future recreational use, particularly use involving vehicles. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. With this alternative, none of the special features found in the 83 WSAs would be protected by wilderness designation.</p>	<p>Wilderness values would be preserved overall in the designated areas which comprise about 30 percent of the total acreage in the 83 WSAs. Wilderness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 54,019 acres. The loss would be due to mineral-related activities, provision of access to in-held State lands, development of rangeland projects, ORV activity, community expansion, campground construction, and development of rights-of-way. About 99 percent of the loss would be in non-designated areas. Opportunities for solitude and primitive and unconfined recreation would be directly lost due to disturbance as described above for naturalness. In addition, opportunities for solitude and primitive and unconfined recreation would be directly reduced in quality on up to 565,381 acres due to the sights and sounds of future development and future recreational use, particularly use involving vehicles. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. With this alternative, approximately 19 percent of the special features found in the 83 WSAs would be protected by wilderness designation.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22 (Continued)
Summary of Impacts Related to Principal Issues

Resource	Alternatives		
	Paramount Wilderness Quality (1,533,030 Acres)	Cluster and Interagency Areas (2,486,732 Acres)	All Wilderness (3,235,834 Acres)
Impacts on Wilderness Values	<p>Wilderness values would be preserved overall in the designated areas which comprise about 47 percent of the total acreage in the 83 WSAs. Wilderness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 48,470 acres. The loss would be due to mineral-related activities, provision of access to in-held State lands, development of rangeland projects, ORV activity, community expansion, campground construction, and development of rights-of-way. About 99 percent of the loss would be in nondesignated areas. Opportunities for solitude and primitive and unconfined recreation would be indirectly reduced in quality on up to 519,578 acres due to the sights and sounds of future development and future recreational use, particularly use involving vehicles. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. With this alternative, approximately 44 percent of the special features found in the 83 WSAs would be protected by wilderness designation.</p>	<p>Wilderness values would be preserved overall in the designated areas which comprise about 77 percent of the total acreage in the 83 WSAs. Wilderness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 13,395 acres. The loss would be due to mineral-related activities, provision of access to in-held State lands, development of rangeland projects, ORV activity, community expansion, campground construction, and development of rights-of-way. About 94 percent of the loss would be in nondesignated areas. Opportunities for solitude and primitive and unconfined recreation would be indirectly reduced in quality on up to 230,598 acres due to the sights and sounds of future development and future recreational use, particularly use involving vehicles. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. With this alternative, approximately 66 percent of the special features found in the 83 WSAs would be protected by wilderness designation.</p>	<p>Wilderness values would be preserved overall in all 83 WSAs. In the foreseeable future, a direct loss of naturalness would occur on an estimated 1,017 acres. The loss would be due to valid existing rights and to other nonconforming but accepted uses permitted by the Wilderness Act. Opportunities for solitude and primitive and unconfined recreation would be directly lost due to disturbance as described above for naturalness. In addition, opportunities for solitude and primitive and unconfined recreation would be indirectly reduced in quality on up to 129,326 acres due to the sights and sounds of future development and future recreational use. Wilderness special features would also be subject to loss due to intrusions and nonwilderness type uses. However, with this alternative, all of the special features found in the 83 WSAs would be protected by wilderness designation.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22 (Continued)
Summary of Impacts Related to Principal Issues

Alternatives		Regional Representative Areas (956,616 Acres)
Resource	BLM Proposed Action (1,975,219 Acres)	
Impacts on Water Use	<p>Nonconsumptive use of water for wilderness purposes would be favored in 35 of the 42 WSAs with perennial streams. Development of a proposed municipal water source would be precluded in one WSA. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 58 of the 66 WSAs that would be designated. The BLM Proposed Action Alternative could complicate future water diversion and use upstream of eight designated areas in Sevier, Wayne, Garfield, Emery, and Carbon Counties because changes in use and points of diversion could be protected by the Federal government to maintain existing water use patterns which support public values such as riparian areas and wildlife. In addition, the Federal government could deny necessary rights-of-way or other approvals for projects that would alter water flow through designated wilderness. The affected streams would be the Escalante River (North Escalante Canyons/The Gulch ISA), Dirty Devil River (Dirty Devil and Fiddler Butte WSAs), Muddy Creek (Crack Canyon and Muddy Creek WSAs), the San Rafael River (Sids Mountain and Mexican Mountain WSAs), and the Price River (Desolation Canyon WSA).</p>	<p>Nonconsumptive use of water for wilderness purposes would be favored in eight of the 42 WSAs with perennial streams. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 12 of the 14 WSAs that would be designated with the Regional Representative Areas Alternative. This alternative could complicate future water diversion and use upstream of two designated WSAs or the San Rafael (Sids Mountain WSA) and Price Rivers (Desolation Canyon WSA) in Emery and Carbon counties.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22 (Continued)
Summary of Impacts Related to Principal Issues

Resource	Alternatives		
	Paramount Wilderness Quality (1,533,030 Acres)	Cluster and Interagency Areas (2,486,732 Acres)	All Wilderness (3,235,834 Acres)
Impacts on Water Use	<p>Nonconsumptive use of water for wilderness purposes would be favored in 22 of the 42 WSAs with perennial streams. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 15 of the 32 WSAs that would be designated with the Paramount Wilderness Quality Alternative. The Paramount Wilderness Quality Alternative would constrain future water diversion and use upstream of seven designated areas in the Sevier, Wayne, Garfield, Emery, and Carbon Counties. The affected streams would be the Escalante River (North Escalante Canyons/The Gulch ISA), Dirty Devil River (Dirty Devil WSA), Muddy Creek (Crack Canyon and Muddy Creek WSAs), the San Rafael River (Sids Mountain and Mexican Mountain WSAs), and the Price River (Desolation Canyon WSA).</p>	<p>Nonconsumptive use of water for wilderness purposes would be favored in 31 of the 42 WSAs with perennial streams. Development of a proposed municipal water source would be precluded in one wilderness area. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 46 of the 53 areas that would be designated with the Cluster and Interagency Areas Alternative. This alternative would constrain future water diversion and use upstream from seven designated areas in Sevier, Wayne, Garfield, Emery, and Carbon Counties. The affected streams would be the Escalante River (North Escalante Canyons/The Gulch ISA), Dirty Devil River (Dirty Devil and Fiddler Butte WSAs), the San Rafael River (Sids Mountain and Mexican Mountain WSAs), the Price River (Desolation Canyon WSA, and Sulfur Creek (Fremont Gorge WSA).</p>	<p>Nonconsumptive uses of water for wilderness purposes would be favored in the 42 WSAs with perennial streams. Development of proposed municipal water sources would be precluded in two wilderness areas. Water uses upstream of the wilderness areas would not be significantly affected by wilderness designation of 74 of the 83 BLM WSAs. The All Wilderness Alternative could complicate future water diversion and use upstream of nine WSAs in Sevier, Wayne, Garfield, Emery, and Carbon Counties. The affected streams would be the Escalante River (North Escalante Canyons/The Gulch ISA), Dirty Devil River (Dirty Devil and Fiddler Butte WSAs), Muddy Creek (Crack Canyon and Muddy Creek WSAs), the San Rafael River (Sids Mountain and Mexican Mountain WSAs), the Price River (Desolation Canyon WSA) and Sulfur Creek (Fremont Gorge WSA).</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22 (Continued)
Summary of Impacts Related to Principal Issues

Alternatives		
Resource	BLM Proposed Action (1,975,219 Acres)	Regional Representative Areas (956,616 Acres)
	No Action/No Wilderness	
Impacts on Mineral and Energy Exploration and Production	<p>Oil and gas resources projected to be developed in all or part of nine WSAs would be foregone with the exception of portions of four WSAs which contain 22,381 acres of pre-FLPMA leases. Significant development of the tar sand and coal resources would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. Development of any other leasable mineral or energy resource is not projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs. Wilderness designation would limit activities to existing mining claims in 22 of the 23 WSAs where exploration and/or development of locatable minerals is projected. Production of locatable minerals would be foregone in the remainder of the designated areas; however, the loss would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.</p>	<p>Oil and gas resources projected to be explored or developed in all or part of five WSAs would be foregone with the exception of portions of two WSAs which contain 5,174 acres of pre-FLPMA leases. Significant development of the tar sand and coal resource would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. Development of any other leasable mineral or energy resource is not projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs. Wilderness designation would limit activities to existing mining claims in seven of the 23 WSAs where exploration and/or development of locatable minerals is projected. In the remainder of the designated areas locatable minerals would be foregone however, the loss of production would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22(Continued)
Summary of Impacts Related to Principal Issues

Alternatives			
	Paramount Wilderness Quality (1,533,030 Acres)	Cluster and Interagency Areas (2,486,732 Acres)	All Wilderness (3,235,834 Acres)
Resource			
Impacts on Mineral and Energy Exploration and Production	<p>Oil and gas resources projected to be developed in all or part of three WSAs would be foregone with the exception of portions of one WSA which contains pre-FLPMA leases. Significant development of the tar sand and coal resource would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. Development of any other leasable mineral or energy resource is not projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs. Wilderness designation would limit activities to existing mining claims in 15 of the 23 WSAs where exploration and/or development of locatable minerals is projected. In the remainder of the designated areas, locatable minerals would be foregone however, the loss of production would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.</p>	<p>Oil and gas resources projected to be explored or developed in all or part of 20 WSAs would be foregone with the exception of portions of nine WSAs which contain 49,878 acres of pre-FLPMA leases. Significant development of the coal resource would be foregone as seven of the 10 WSAs where coal production is projected would be designated wilderness. About 13 percent of the total in-place coal resource in Utah could not be developed. Long-term production of bitumen from tar sand would be foregone on one of the three WSAs where production is projected. Development of any other leasable mineral or energy resource is not projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs. Wilderness designation would limit activities to existing mining claims in 14 of the 23 WSAs where exploration and/or development of locatable minerals is projected. In the remainder of the designated areas, locatable minerals would be foregone however, the loss of production would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.</p>	<p>Oil and gas resources projected to be developed in 10 WSAs would be foregone with the exception of portions of seven WSAs which contain pre-FLPMA leases. Significant development of the tar sand resource projected to occur in three WSAs would be foregone. About 10 percent of the total in-place tar sand resource in Utah could not be developed. Coal development projected to occur in 10 WSAs would also be foregone with the All Wilderness Alternative. About 17 percent of the total in-place coal resource in Utah could not be developed. Development of any other leasable energy or mineral resource is not projected and, therefore, would not be foregone with this alternative. All 3,235,834 acres would be closed to locatable mineral entry. Exploration and production would be allowed on 5,527 existing mining claims (110,540 acres) in 23 WSAs and any future claims located prior to wilderness designation. Any locatable mineral found within the WSAs but not under valid mining claim would be foregone. The loss of production of locatable minerals from WSAs would not be significant on a Statewide or national basis.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22(Continued)
Summary of Impacts Related to Principal Issues

Alternatives			
BLM Proposed Action (1,975,219 Acres)		Regional Representative Areas (956,616 Acres)	
Resource	No Action/No Wilderness		
Impacts on Local Economic Conditions	<p>Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant on a Statewide basis or to any MCD region as a whole. The BLM proposed action alternative generally would accommodate the long-term potential for tar sand and coal development. The long-term potential for future extraction of tar sand bitumen and Kaiparowits coal, could be significant to local communities, should it occur. Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs not designated as wilderness and having predicted long-term potential for major tar sand and coal projects. Federal revenues from WSAs would increase less than \$2 million per year, primarily due to speculative oil and gas leases. Federal revenues may increase as a result of future royalties from oil, gas, tar sand, and coal extraction. Livestock grazing fees from WSAs could increase by \$3,798 annually. Increases would be insignificant on a Statewide basis.</p>	<p>Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of tar sand bitumen, and Kaiparowits coal. Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs with long-term potential for major tar sand and coal projects. It is estimated that annual Federal revenues would be about \$4.4 million for mineral leases. They would increase by \$5,248 per year for livestock grazing, and be up to \$4,000 per year for recreation in the foreseeable future. Annual recreation revenue increases would reflect the normal baseline growth patterns. In the long term, Federal revenues may increase as a result of future royalties from oil, gas, tar sand, and coal extraction.</p>	<p>With this alternative, the predicted baseline for employment would not be significantly altered (see Chapter 3). While existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8). Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of bitumen from tar sand and Kaiparowits coal. Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent change) would occur in localities immediately adjacent to the WSA areas having predicted long-term potential for major tar sand and coal projects. The nature and magnitude of such impacts would be similar to those of the No Action/No Wilderness Alternative. Federal revenues from WSAs would increase by up to about \$3.4 million per year in the foreseeable future, primarily as a result of speculative oil and gas leasing. In the long term, Federal revenues may increase as a result of royalties from oil, gas, tar sand, and coal extraction. Livestock grazing fees from WSAs could increase by \$4,648 annually.</p>

CHAPTER 2: DESCRIPTION OF THE STATEWIDE ALTERNATIVES

Table 22 (Continued)
Summary of Impacts Related to Principal Issues

Alternatives		
	Cluster and Interagency Areas (2,486,732 Acres)	All Wilderness (3,235,834 Acres)
Resource	Paramount Wilderness Quality (1,533,030 Acres)	
Impacts on Local Economic Conditions	<p>Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of bitumen from tar sand and Kaiparowits coal, should it occur. The employment impacts for this alternative essentially would be the same as with the BLM Proposed Action Alternative. Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs not designated as wilderness and having predicted long-term potential for major tar sand and coal projects. The magnitude of such impacts would be similar to the BLM Proposed Action Alternative. Federal revenues from WSAs would increase by up to about \$2.7 million per year primarily due to speculative oil and gas leasing. Federal revenues may increase as a result of future royalties from oil, gas, tar sand, and coal extraction. Livestock grazing fees from WSAs could increase by \$3,915 annually.</p>	<p>Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment, or jobs foregone, related to the WSAs would not be significant to any of the MCDs or local communities; except for those jobs that may be foregone with elimination of the long-term potential for future extraction of large quantities of tar sand and Kaiparowits coal in Emery, Wayne, Uintah, Garfield, and Kane Counties. These foregone mineral extraction jobs would likely not be significant to any of the MCDs as a whole, but may be significant to certain nearby communities where the jobs foregone could equal or exceed 5 percent of the baseline labor force. Most existing and allowed activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) impact would occur in localities immediately adjacent to the WSAs where substantial potential employment and sales related to the long-term possibilities for major tar sand and coal projects would be foregone. Federal revenues of up to \$4.4 million from minerals activities (including speculative oil and gas leasing) largely would be foregone. Those from grazing in WSAs would remain essentially the same as now exists, and up to \$5,248 in potential annual grazing revenues also would be foregone. Revenues from commercial recreation visitation would increase slightly.</p>

AFFECTED ENVIRONMENT

Affected Environment

INTRODUCTION

The chapter briefly describes the affected environment and the proposed project.

emphasizing the natural, historical, and cultural resources of the area. The chapter also includes a description of the project area and the proposed project. The chapter also includes a description of the project area and the proposed project.

WILDLIFE VALUES

Background

A general review of the wildlife and the effects of the project on the wildlife resources of the area. The chapter also includes a description of the project area and the proposed project.



J. Nielsen

CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter briefly describes the affected environment of the State of Utah and the 83 BLM WSAs. It emphasizes the western, southern, and eastern portions of Utah where BLM WSAs are located (refer to Map 1). Unless otherwise stated, information for this chapter was taken from either the 83 individual WSA analyses (EIS Volumes II through VI) and/or inventory and planning documents, file records in each of the BLM District or Area Offices, or personal knowledge of BLM's resource specialists.

WILDERNESS VALUES

Background

A general overview of the NWPS and the wilderness review in Utah is given in Chapter 1. Of the 52,541,440 acres in the State of Utah, about 5,352,958 acres (10.2 percent) have either been Federally designated as wilderness or are currently under Federal wilderness review.

Table 23
Designated Wilderness Areas in Utah

	Managing Agency	Year Designated	Acres
Ashdown Gorge	FS	1984	7,000
Box-Death Hollow	FS	1984	26,000
Dark-Woodenshoe Canyon	FS	1984	45,000
Twin Peaks	FS	1984	13,100
Mt. Naomi	FS	1984	44,350
Mt. Nebo	FS	1984	28,000
Mt. Timpanagos	FS	1984	10,750
Mt. Olympus	FS	1984	16,000
Pine Valley Mountain	FS	1984	50,000
Wellsville Mountain	FS	1984	23,850
High Uintas	FS	1984	460,000
Lone Peak	FS	1977	30,088
Deseret Peak	FS	1984	25,500
Paria Canyon ^a	BLM	1984	20,000
Beaver Dam Mountains ^a	BLM	1984	2,600
	Total		802,238

Source: USDI, USGS, 1987.

^aPortions of this wilderness area are located in both Utah and Arizona. The acreage given is Utah acreage only.

There are 15 areas (802,238 acres) of designated wilderness in Utah (refer to Table 23). Of these, 13

are managed by the Forest Service and two are managed by BLM. There are 1,292,814 acres of land within eight national parks and monuments in Utah recommended in 1979 by the National Park Service for wilderness designation. These are listed in Table 24. Five BLM Instant Study Areas (ISAs) totaling 3,352 acres: Book Cliffs, Devil's Garden, Joshua Tree, Link Flats, and Escalante Canyon Tract 1, were studied and recommended as unsuitable for wilderness designation. These five areas are still considered under wilderness review until Congress takes action to designate or release them.

Table 24
NPS Areas Administratively Endorsed
for Wilderness Designation

Area	Proposed Wilderness Acreage
Dinosaur National Monument ^a	39,684
Glen Canyon National Recreation Area ^b	576,975
Zion National Park	120,620
Arches National Park	62,947
Capitol Reef National Park	179,815
Canyonlands National Park	287,133
Bryce Canyon National Park	20,810
Cedar Breaks National Park	4,830
	1,292,814

Source: BLM file data.

^aPortions of this area are within Utah and Colorado. Acreages given are in the Utah portion only.

^bPortions of this area are within Utah and Arizona. Acreages given are in the Utah portion only.

There are a total of 90 WSAs (3,254,554 acres) in Utah currently under wilderness review. Of these, seven WSAs (24,120 acres) are partially in Utah and are being studied by other states. These are listed in Table 25. Table 2 and Pocket Map 1 show the 83 WSAs (3,235,834 acres) considered in this document. Of the 83 WSAs, 29 WSAs are contiguous to other Federal lands under review for or that have been designated as wilderness. These are listed in Table 26. The 83 WSAs considered in this document include the following eight ISAs: Phipps Death Hollow; North Escalante Canyons/The Gulch; Escalante Canyon, Tracts 2, 3, 4, and 5; Dark Canyon; and Grand Gulch.

CHAPTER 3: AFFECTED ENVIRONMENT

Table 25
WSAs Partially in Utah Being Studied
by Adjacent States

WSA	Adjacent State Involved	Acres of WSA in Utah
White Rock Range	Nevada	3,820
Black Ridge Canyon West	Colorado	5,100
Squaw Canyon	Colorado	6,580
Cross Canyon	Colorado	1,000
West Cold Springs	Colorado	3,200
Diamond Breaks	Colorado	3,900
Bull Canyon	Colorado	520
Total		24,120

Source: BLM File Data.

Wilderness Values of Utah WSAs

The 83 WSAs in Utah all have at least the minimum wilderness values necessary to qualify for wilderness study. Wilderness values considered in the review include an area's size, naturalness, outstanding opportunities for solitude or primitive types of recreation, and special features including ecological, geological, or other features of scientific, educational, scenic, or historic value. Table 27 identifies the wilderness values for each WSA.

• Size

All WSAs meet one of two size criteria: (1) they are at least 5,000 acres in size; or (2) although less than 5,000 acres in size, they are contiguous to either a designated wilderness area or lands under wilderness study by another Federal agency. Of the WSAs considered in this EIS, 68 WSAs totaling 3,213,320 acres meet the first criterion and 15 WSAs totaling 22,514 acres meet the second criterion.

• Naturalness

Naturalness refers to the requirement in Section 2(c) of the Wilderness Act that a wilderness area "generally appears to be affected by the forces of nature, with the imprint of man's work substantially unnoticeable."

All of the WSAs are remnants of natural landscapes. They are located in remote and little developed areas of the State; primarily south, east, and west of Utah's urbanized Wasatch Front.

Most of the WSAs have minor human imprints within their boundaries. Almost all WSAs are grazed by livestock, and many human traces are associated with the management of livestock. Imprints include vehicle tracks (or ways, as they are called in the wilderness review), livestock watering reservoirs, spring developments, water pipelines, and fences. Some WSAs contain guzzlers with small aprons used to collect rain water or snowmelt for wildlife. Evidences of past mining activities include mine shafts, cabins, drill pads, and ways. Generally, in many areas these human imprints are substantially unnoticeable in the WSA as a whole due to such factors as size, color, location, screening by topography or vegetation, etc.

In all, 3,205,047 acres under review meet the Wilderness Act criterion for naturalness and 30,787 acres do not. All of the WSAs meet this criterion in a large part (refer to Table 27).

• Solitude

The Wilderness Act requires that wilderness areas offer outstanding opportunities for a person to be alone in a natural setting with few reminders that others have been there in the past. The features considered in evaluating an area's outstanding opportunities for solitude are: (1) size and configuration; (2) topographic screening; (3) vegetation screening; (4) the significance of outside sights and sounds; and (5) the ability of a user to find a secluded spot.

Approximately 2,298,801 acres under review meet the Wilderness Act criterion for solitude and 937,033 acres do not. All 83 WSAs under consideration meet the criterion at least in part (refer to Table 27).

• Primitive and Unconfined Recreation

Most WSAs offer outstanding opportunities for dispersed, undeveloped recreation that does not require facilities or motorized equipment. Those areas which the BLM wilderness inventory found to possess outstanding opportunities for this type of recreation contain either a diversity of possible activities or at least one activity of outstanding quality.

Opportunities include hiking and backpacking in mountainous areas such as the Deep Creek Mountains WSA or along desert rivers such as the Parunuweap Canyon WSA; viewing expansive desert vistas from the heights of such areas as Fifty Mile Mountain WSA; and floating rivers such as the Green and Colorado

CHAPTER 3: AFFECTED ENVIRONMENT

Table 26
BLM WSAs Contiguous With Other Federal Agency Wilderness Areas or
Areas Under Wilderness Review

WSA Name	Acres of WSA	Contiguous Other Federal Agency Wilderness/Wilderness Review Lands	Contiguous Wilderness/ Wilderness Review Acres
LaVerkin Creek Canyon	567	Zion National Park	120,620
Deep Creek	3,320	Zion National Park	120,620
North Fork Virgin River	1,040	Zion National Park	120,620
Orderville Canyon	1,750	Zion National Park	120,620
Parunuweap Canyon	30,800	Zion National Park	120,620
Canaan Mountain	47,170	Zion National Park	120,620
Phipps-Death Hollow	42,731	Box-Death Hollow Wilderness (FS)	26,000
North Escalante Canyons/The Gulch	119,752	Glen Canyon National Recreation Area	576,975 ^a
Scorpion	35,884	Glen Canyon National Recreation Area	576,975 ^a
Escalante Canyons Tract 5	760	Glen Canyon National Recreation Area	576,975 ^a
Fifty Mile Mountain	146,143	Glen Canyon National Recreation Area	576,975 ^a
Horseshoe Canyon (South)	38,800	Canyonlands National Park	287,133
Fiddler Butte	73,100	Glen Canyon National Recreation Area	576,975 ^a
Little Rockies	38,700	Glen Canyon National Recreation Area	576,975 ^a
Mancos Mesa	51,440	Glen Canyon National Recreation Area	576,975 ^a
Grand Gulch	105,520	Glen Canyon National Recreation Area	576,975 ^a
Dark Canyon	68,030	Glen Canyon National Recreation Area	576,975 ^a
		Dark-Woodenshoe Canyon Wilderness (FS)	45,000
		Canyonlands National Park	
Butler Wash	24,190	Canyonlands National Park	287,133
Indian Creek	6,870	Canyonlands National Park	287,133
Horseshoe Canyon (North)	20,500	Canyonlands National Park	287,133
South Needles	160	Canyonlands National Park	287,133
Red Butte	804	Zion National Park	120,620
Spring Creek Canyon	4,433	Zion National Park	120,620
The Watchman	600	Zion National Park	120,620
Taylor Creek Canyon	35	Zion National Park	120,620
Goose Creek Canyon	89	Zion National Park	120,620
Beartrap Canyon	40	Zion National Park	120,620
Fremont Gorge	2,540	Capital Reef National Park	179,815
Lost Spring Canyon	3,880	Arches National Park	62,947
Daniels Canyon	2,496	Dinosaur National Monument	39,684 ^b

Source: BLM file data.

^a Portions of this area are located in both Utah and Arizona. The acreage given is Utah acreage only.

^b Portions of this area are located in both Utah and Colorado. The acreage given is Utah acreage only.

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Table 27
Wilderness Values of WSAs

WSA Name	WSA Acres	Naturalness (Acres)	Outstanding Solitude (Acres)	Outstanding Primitive Unconfined Recreation (Acres)	Special Features				
					Scenic	Histori- cal	Ecologi- cal	Geologi- cal	Other
North Stansbury Mountains	10,480	10,280	5,810	5,760	X	X	X	X	X
Cedar Mountains	50,500	50,000	5,280	0		X	X		X
Deep Creek Mountains	68,910	68,910	62,364	62,364	X	X	X	X	X
Fish Springs	52,500	52,500	25,200	25,200			X	X	
Rockwell	9,150	9,150	5,044	4,495	X		X	X	
Swasey Mountain	49,500	49,500	32,175	32,175	X	X	X	X	X
Howell Peak	24,800	24,800	14,880	0	X		X	X	
Conger Mountain	20,400	20,400	14,280	0			X		X
Notch Peak	51,130	51,130	28,130	28,130	X	X	X	X	
King Top	84,770	84,770	50,000	1,920		X	X	X	X
Wah Wah Mountains	42,140	42,140	40,940	40,940	X		X	X	
Cougar Canyon	15,968	15,968	1,300	400	X	X	X	X	X
Red Mountain	18,290	18,285	4,240	2,640	X	X	X	X	
Cottonwood Canyon	11,330	11,330	5,200	1,800	X		X	X	
LaVerkin Creek Canyon	567	567 ^a	567 ^a	567 ^a	X		X	X	
Deep Creek	3,320	3,320 ^a	3,320 ^a	3,320 ^a	X		X	X	X
North Fork Virgin River	1,040	1,040	150	150	X		X	X	X
Orderville Canyon	1,750	1,750 ^a	1,167 ^a	1,167 ^a	X		X	X	
Parunuweap Canyon	30,800	30,800	17,600	17,500	X	X	X	X	X
Canaan Mountain	47,170	46,700	37,000	28,000	X	X	X	X	X
Moquith Mountain	14,830	14,783	8,800	7,300	X	X	X	X	X
The Blues	19,030	19,030	1,600	3,000			X	X	
Mud Spring Canyon	38,075	38,075	18,000	14,600	X		X	X	X
Paria-Hackberry	136,222	136,222	89,700	90,100	X	X	X	X	X
The Cockscomb	10,080	10,030	4,319	5,600	X		X	X	X
Wahweap	134,400	134,400	13,440	0	X	X	X	X	
Burning Hills	61,550	61,550	27,700	0	X		X	X	
Death Ridge	62,870	62,870	31,435	0	X	X	X	X	
Phipps-Death Hollow	42,731	42,731	36,000	36,000	X	X	X	X	X
Steep Creek	21,896	21,876	15,500	18,100	X	X	X	X	X
North Escalante Canyons/The Gulch	119,752	119,752	89,814	94,604	X	X	X	X	X
Carcass Canyon	46,711	46,711	26,500	11,800	X	X	X	X	
Scorpion	35,884	35,876	9,700	11,400	X		X	X	X
Escalante Canyons Tract 5	760	760 ^a	230 ^a	33 ^a	X		X	X	
Fifty Mile Mountain	146,143	146,143	69,000	67,000	X	X	X	X	X
Mt. Ellen-Blue Hills	81,726	80,116	60,000	37,000	X	X	X	X	X
Bull Mountain	13,620	13,060	13,620	13,620	X		X	X	
Dirty Devil	61,000	61,000	49,000	49,000	X	X	X	X	X
Horseshoe Canyon (South)	38,800	38,800	36,300	28,400	X	X	X	X	X
French Spring-Happy Canyon	25,000	25,000	11,000	11,000	X	X	X	X	
Fiddler Butte	73,100	64,300	15,600	32,700	X	X	X	X	X
Mt. Pennell	74,300	71,000	17,800	17,800	X	X	X	X	X
Mt. Hillers	20,000	19,000	15,630	15,630	X		X	X	
Little Rockies	38,700	38,700	27,700	27,700	X	X	X	X	
Mancos Mesa	51,440	46,120	46,120	46,120	X	X	X	X	
Grand Gulch	105,520	105,520	103,920	105,520	X	X	X	X	
Road Canyon	52,420	52,420	45,720	23,220	X	X	X	X	
Fish Creek Canyon	46,440	46,440	44,940	46,440	X	X	X	X	
Mule Canyon	5,990	5,990	5,190	5,990	X	X	X	X	
Cheesebox	15,410	15,410	9,310	9,310	X	X	X	X	
Dark Canyon	68,030	68,030	68,030	68,030	X	X	X	X	X
Butler Wash	24,190	24,190	24,190	24,190	X	X	X	X	
Bridger Jack Mesa	5,290	5,290	5,290	5,290	X	X	X	X	

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Table 27 (Continued)
Wilderness Values of WSAs

WSA Name	WSA Acres	Naturalness (Acres)	Outstanding Solitude (Acres)	Outstanding Primitive Unconfined Recreation (Acres)	Special Features				
					Scenic	Histori- cal	Ecologi- cal	Geologi- cal	Other
Indian Creek	6,870	6,870	6,870	6,870	X	X	X	X	
Behind The Rocks	12,635	12,635	12,635	12,635	X	X	X	X	
Mill Creek Canyon	9,780	9,780	2,800	2,800	X	X	X	X	X
Negro Bill Canyon	7,620	7,020	1,375	2,300	X	X	X	X	X
Horseshoe Canyon North	20,500	20,500	20,500	20,500	X	X	X	X	X
San Rafael Reef	59,170	59,170	58,578	59,170	X	X	X	X	
Crack Canyon	25,335	25,335	25,300	25,335	X		X	X	X
Muddy Creek	31,400	31,400	31,400	31,400	X		X	X	X
Devils Canyon	9,610	8,950	7,050	3,200	X	X	X	X	X
Sids Mountain/Sids Cabin	80,970	80,543	76,970	80,970	X	X	X	X	X
Mexican Mountain	59,600	59,600	53,600	59,600	X	X	X	X	X
Jack Canyon	7,500	7,350	7,275	7,500	X		X	X	X
Desolation Canyon	290,845	290,845	287,910	290,845	X	X	X	X	X
Turtle Canyon	33,690	33,690	33,690	33,690	X	X	X	X	X
Floy Canyon	72,605	72,605	68,975	72,605	X		X	X	X
Coal Canyon	61,430	61,430	61,430	61,430	X		X	X	X
Spruce Canyon	20,350	20,350	20,350	20,350	X		X	X	X
Flume Canyon	50,800	50,800	50,800	50,800	X		X	X	
Westwater Canyon	31,160	31,160	20,600	7,760	X	X	X	X	X
Winter Ridge	42,462	35,835	31,897	0		X	X		X
Red Butte	804	804 ^a	603 ^a	180 ^a	X		X	X	
Spring Creek Canyon	4,433	4,433 ^a	3,728 ^a	3,568 ^a	X		X	X	
The Watchman	600	600 ^a	450 ^a	450 ^a	X		X	X	
Taylor Creek Canyon	35	35 ^a	35 ^a	35 ^a	X		X	X	
Goose Creek Canyon	89	89 ^a	89 ^a	89 ^a	X		X	X	
Beartrap Canyon	40	40 ^a	40 ^a	40 ^a	X		X	X	
Fremont Gorge	2,540	2,540 ^a	2,540 ^a	0	X		X	X	X
Lost Spring Canyon	3,880	3,880 ^a	2,910 ^a	2,910 ^a	X		X	X	
Daniels Canyon	2,496	2,496 ^a	2,496 ^a	0	X	X	X	X	X
South Needles	160	160	160	160	X		X	X	
Totals	3,235,834	3,205,047	2,298,801	2,041,467	77	49	83	79	44

Source: WSA Analyses.

^aWSA contains the given values when combined with contiguous wilderness or wilderness review lands.

rivers in the Desolation Canyon and Westwater WSAs, respectively.

In all, 2,041,467 acres under review meet the Wilderness Act criterion for outstanding opportunities for primitive and unconfined recreation and 1,194,367 acres do not. Of the 83 WSAs under consideration, 74 WSAs meet the criterion at least in part (refer to Table 25).

• Special Features

Many of the WSAs contain ecological, geological, or other features of scientific, educational, scenic, or

historical value that, based on the estimated abundance or importance of each of these features, contributes to the value of the areas as wilderness. These are indicated on Table 27 and are divided into five categories: scenic, historical, ecological, geological, and other.

WSAs recognized as having special scenic features possess areas of high quality (Class A) scenery or special scenic features.

Most WSAs contain some cultural resources. WSAs recognized as having special historic features either have a known or likely abundance of archaeological or

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historic sites or have at least one known site that is listed or has the potential for listing on the National Register of Historic Places. All of the WSAs in San Juan County fit this category.

WSAs recognized as having special ecological features contain uncommon plant or animal communities. Special botanical features may include anything from diverse assemblages of plant species, species of special interest, relict plant communities, or threatened, endangered, or other special status plant species. Special animal features include the presence of wildlife species inhabiting only remote areas free from human disturbance. Such animals include elk, bear, cougar, and bison. Threatened, endangered, or other special status species also are included.

WSAs recognized as having special geological features display uncommon or excellent examples of geologic formations, fossils, or caves. In Utah special scenic features often involve geological attributes; therefore, WSAs identified as having special scenic features often have special geological features as well.

WSAs recognized as having other special features either have wild horses or perennial water, or both.

Diversity of the National Wilderness Preservation System

One criterion in the wilderness review is the extent to which designation would contribute to the diversity of the NWPS. The following three components of diversity are considered:

1. Ecosystems and landforms in wilderness areas.
2. Opportunities for solitude or primitive recreation in wilderness areas within a day's driving time (5 hours) of major population centers.
3. The geographic distribution of wilderness areas.

The analysis of diversity in the NWPS includes consideration of existing and potential wilderness areas.

• Ecosystems and Landforms

Wilderness designation is intended to preserve examples of ecosystems and landforms in an unimpaired condition for future generations.

To provide a uniform basis for comparing natural systems of existing and potential wilderness areas, all BLM wilderness studies, nationwide, use the Bailey-Kuchler Ecosystems map (USDI, USGS, 1978) which classifies lands according to ecoregions and potential natural vegetation (PNV).

PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research due to its value in determining the biological potential of an area. The Bailey-Kuchler system for classification is based on an integration of natural factors of climate, vegetation, soils, and landforms. Ecoregions and PNV types found in Utah are identified on Table 28. Of the 31 PNV types in Utah, 21 occur within BLM WSAs. Sixteen of the 21 PNV types found in Utah WSAs are not found in currently designated wilderness areas in Utah. Eight of the 21 PNV types found in Utah WSAs are not found in currently designated wilderness areas nationwide.

Refer to Table 29 which displays ecosystem diversity in BLM WSAs in comparison to designated wilderness areas in Utah and designated wilderness areas nationwide.

Proximity To Population Centers

House Report Number 95-540, on the Endangered American Wilderness Act, states that one of the goals of Congress is "creating parks and locating wilderness areas within close proximity to population centers" (Ninety-Fifth Congress of the U.S., 1978). Therefore, one of many considerations in the wilderness review is whether an area is relevant covenant to a major population center.

Population centers are defined as standard metropolitan statistical areas (SMSAs) that have populations of 100,000 or greater. An SMSA is defined as a county containing at least one city of 50,000 inhabitants or more plus as many adjacent counties that are metropolitan in character and are socially integrated with that central city or cities (USDC, Bureau of the Census, 1981). Table 30 indicates the number and acres of designated and potential wilderness in Utah within a 1-day drive from SMSAs. Of the 83 WSAs, 60 are within a 1-day drive of SMSAs and 22 are not within a 1-day drive of any SMSAs.

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Table 28
Ecoregion and PNV Types in Utah

Ecoregion Map Reference	Ecoregion	Potential Natural Vegetation (PNV)	PNV Type Reference
3130	Intermountain Sagebrush Province	Western Ponderosa Forest	10
		Spruce-Fir-Douglas Fir Forest	19
		Juniper-Pinyon Woodland	21
		Mountain Mahogany-Oak Shrub	31
		Great Basin Sagebrush	32
		Saltbrush-Greasewood	34
		Desert: Vegetation Largely Absent	39
		Tule Marshes	42
		Sagebrush Steppe	49
M3110	Rocky Mountain Forest Province	Douglas Fir Forest	11
		Western Spruce-Fir Forest	14
		Arizona Pine Forest	18
		Spruce-Fir-Douglas Fir Forest	19
		Juniper-Pinyon Woodland	21
		Mountain Mahogany-Oak Shrub	31
		Great Basin Sagebrush	32
		Saltbush-Greasewood	34
		Alpine Meadows and Barren	45
		Sagebrush Steppe	49
P3130	Colorado Plateau Province	Pine-Douglas Fir Forest	17
		Arizona Pine Forest	18
		Southwestern Spruce-Fir Forest	20
		Juniper-Pinyon Woodland	21
		Mountain Mahogany-Oak Shrub	31
		Great Basin Sagebrush	32
		Blackbrush	33
		Saltbush-Greasewood	34
		Wheatgrass-Bluegrass	44
		Galleta-Threeawn Shrub Steppe	51
3220	American Desert Province	Creosote Bush	35
A3140	Wyoming Basin Province	Sagebrush Steppe	49

Source: USDI, USGS, 1978.

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Table 29
Ecosystem Diversity in Utah WSAs

Ecosystem ^a	Number of Utah WSA Ecosystems ^b	Utah WSA Acres	Nationwide Number of BLM WSA Ecosystems Also in Utah WSAs	Nationwide BLM WSA Acres as Applicable	Number of Utah NWPS Ecosystems	Utah NWPS Acres	Nationwide NWPS Ecosystems Also in Utah WSAs	Nationwide Number of NWPS Ecosystem Acres
3220/33	1	2,000	1	2,000	0	0	0	0
3220/21	1	1,500	25	70,711	0	0	1	21,485
P3130/18	9	20,050	9	20,050	0	0	3	26,300
P3130/33	12	230,064	12	230,064	0	0	0	0
P3130/11	3	69,720	3	69,720	0	0	0	0
P3130/51	11	190,726	11	190,726	0	0	0	0
P3130/21	54	1,706,198	85	2,143,105	1	26,000	10	1,393,647
P3130/31	5	31,861	5	31,861	0	0	1	8,105
P3130/17	2	5,240	8	18,932	1	45,000	6	124,545
P3130/34	18	394,003	18	394,003	1	20,000	1	20,000
P3130/19	3	6,000	3	6,000	0	0	0	0
3130/33	1	2,000	1	2,000	0	0	0	0
3130/32	2	20,405	57	1,219,275	0	0	1	32,407
3130/21	14	259,533	78	2,162,903	1	2,600	4	81,301
3130/34	8	146,845	38	1,060,726	0	0	3	45,533
3130/19	2	51,562	2	51,562	0	0	0	0
3110/10	1	23,910	3	36,485	0	0	5	102,151
M3110/18	4	1,233	4	1,233	2	24,902	2	24,907
M3110/21	4	65,593	20	186,141	1	12,355	2	42,625
M3110/31	2	5,345	6	33,470	7	80,852	7	80,852
M3110/49	1	2,496	23	247,843	0	0	4	76,129

Source: BLM Washington Office and Utah State Office Data Files.

^aRefer to Table 28 for names of ecosystems and PNV types.

^bTotal exceeds 83 WSAs, as many WSAs contain more than one ecosystem and/or PNV type.

In applying this criterion, a 1-day drive is defined as a 5-hour driving time. For this EIS, determination of a 5-hour driving time was made on a case-by-case basis, allowing for variations in terrain, directness of routes, and road types.

Distribution of Wilderness Areas

Geographic distribution of existing and potential wilderness is another criterion used in the wilderness review. Table 31 lists the number and acreage of existing and potential wilderness areas within the five regions of the State where WSAs are found, as shown in Table 1.

Table 30
Areas Within A 1-Day Drive from SMSAs

SMSA	Designated Wilderness		BLM WSAs		Administratively Endorsed (NPS) Areas	
	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres
Salt Lake City-Ogden, Utah	11	685,088	42	1,826,904	7	1,143,811
Provo-Orem, Utah	12	730,088	52	2,307,031	7	1,143,811
Las Vegas,	4	79,551	28	703,208	2	125,450

Source: BLM File Data.

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Table 31 also shows an additional area, the north-central region, that is the central mountainous portion of Utah where there are no BLM WSAs.

Table 31

Geographic Distribution of Designated
And Potential Wilderness Areas In Utah

Regions	Designated Wilderness		BLM WSAs		Administratively Endorsed (NPS) Areas	
	Number of Areas	Acres	Number of Areas	Acres	Number of Areas	Acres
West-Central	1	25,500	11	464,280	0	0
South-West	5	105,600	30	1,027,170	3	146,260
South-Central	0	0	10	428,786	2	756,790
South-East	1	45,000	16	436,175	2	321,697
East-Central	0	0	16	879,423	1	39,684
North-Central	8	626,138	0	0	0	0
Totals	15	802,238	83	3,235,834	8	1,264,431

Source: BLM File Data.

CLIMATE AND AIR QUALITY

BLM WSAs include areas that reflect the climatic extremes in Utah. Average annual precipitation ranges from 5 inches in the low areas to 25 inches in the Henry Mountains and mountain ranges of the West Desert. Temperatures in WSAs fluctuate from subzero in the winter to over 100 degrees in the summer.

Visibility within and surrounding BLM WSAs generally is excellent, with visual range from within WSAs often 70 to 100 miles or more. Utah is part of the area with the highest visual range in the United States (Environmental Protection Agency [EPA], 1979).

All areas within Utah, with the exception of the urbanized Wasatch Front, have a Prevention of Significant Deterioration (PSD) classification of either Class I or Class II under the Clean Air Act Amendments. Five national parks (i.e., Bryce, Zion, Capitol Reef, Canyonlands, and Arches) are classified as mandatory Class I which protects air quality related values (including visibility) and allows very little air quality degradation (EPA, 1979). Class I areas represent approximately 835,000 acres of the total 52,541,440 acres in Utah or approximately 1.6 percent of the State. All Class I areas are in the southern part of the State (refer to Map 2).

In addition to stringent air quality protection within Class I areas, visibility regulations provide for protection of integral vistas associated with these areas. (An integral vista is a view of a specific landmark or panorama located outside of the Class I area but perceived from within a mandatory Class I area.) The NPS has identified integral vistas for the five national parks in Utah; however, on October 25, 1985, the Secretary of the Interior indicated that these vistas would not formally be proposed to EPA or the State of Utah. The State of Utah's regulations provide for protection of visibility within Class I areas only. The State of Utah is proceeding with rulemaking for protection of the Federal PM-10 standards (particulate matter less than micrometers in size). Compliance with these standards will provide a measure of additional visibility protection for wilderness areas.

BLM is preparing an air quality and visibility monitoring process for determining desired conditions for wilderness areas.

Other than the Class I areas, lands within rural attainment areas in Utah are Class II air quality which allows moderate, well-controlled growth. All BLM WSAs are Class II. Under the BLM Wilderness Management Policy (BLM Manual 8560), designated wilderness areas would continue to be managed as Class II until such time as the State of Utah reclassifies them. BLM would not recommend reclassification to Class I in connection with wilderness recommendations to Congress. WSAs would not automatically be designated Class I as a result of wilderness designation. Upon designation, areas would become Class II "floor areas" under the Clean Air Act. These areas cannot be reclassified to Class III but could be reclassified to Class I by the State following procedures outlined in the PSD regulations.

Altogether, 28 of the 83 BLM WSAs are contiguous with or in close proximity to one of the five national parks. Air quality in these WSAs presently receives more stringent air quality protection because of their proximity to Class I areas. Their proximity also suggests that their air quality related values are similar to those found in Class I areas. If, after wilderness designation, BLM determined that air quality related values were important attributes of some wilderness areas, it could recommend that the State of Utah consider redesignating such areas as Class I, following the procedure outlined in the PSD regulations.

On September 7, 1979, it was recommended (pursuant to Section 164d of the Clean Air Act Amendment

AIR QUALITY

MANDATORY CLASS I AREAS

● SALT LAKE CITY

● VERNAL

**ARCHES
NATIONAL
PARK**

● MOAB

● RICHFIELD

**CAPITOL REEF
NATIONAL PARK**

**CANYONLANDS
NATIONAL PARK**

● CEDAR CITY

**BRYCE CANYON
NATIONAL PARK**

**ZION
NATIONAL
PARK**

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of 1977) that the Dark Canyon and Grand Gulch primitive areas contained air quality related values worthy of redesignation to Class I. No action has been taken on these recommendations by the State of Utah. It is the prerogative of the State of Utah to determine whether or not such reclassification procedures should be implemented.

GEOLOGY AND TOPOGRAPHY

Nearly all of Utah is within either the Basin and Range Physiographic Province or the Colorado Plateau Physiographic Province (Stokes, 1977). Elevations range from 3,200 feet above sea level in the Red Mountain WSA near St. George to over 12,000 feet in the Deep Creek Mountains of the West Desert.

The Basin and Range (also called Great Basin) Province is characterized by broad valleys separated by numerous north-south trending mountain ranges. Extensive playas and alluvial valleys cover about 40 percent of the province in Utah. The north-south trending mountain ranges, formed by complex folding and fault block geologic activity, cover about 25 percent of the province in Utah (USDA, FS, 1978). The Basin and Range Province covers about 40 percent of the State, but basically includes only one of the BLM study regions (the West-Central Region, commonly referred to as Utah's West Desert), where 11 WSAs are located. One WSA in the extreme western part of the South-West Region is also within the Basin and Range Province. Exposed formations in this province are generally Paleozoic, and marine fossils are abundant in many areas. Several WSAs in this province exhibit Tertiary volcanic activity that preceded blockfaulting and deposited large amounts of igneous material.

The Colorado Plateau Province is noted for rolling or flat plateaus and mesas, steep-walled canyons, and striking rock colors and patterns. Natural erosion of extensive sandstone formations is a dominant landform condition. In addition to the vast expanses of mesas, irregular dissected plateaus, benchlands, cliffs, and canyons, the province has several isolated mountain groups such as the Henry Mountains and the LaSal Mountains in Utah. The Colorado Plateau Province covers more than 50 percent of Utah and includes four of the five BLM wilderness study regions, containing 69 WSAs. Two WSAs in the South-West Region are in a transitional zone between the Basin and Range and Colorado Plateau Provinces (refer to Table 32). Exposed formations range from pre-Cambrian to Tertiary with Mesozoic formations

forming many of the spectacular sandstone cliffs and reefs. These formations also are noted for their dinosaur and other fossil remains.

Table 32
Physiographic Provinces of WSAs

Physiographic Province	Section	Number of WSAs	Acres in WSAs
Basin and Range	West Desert	12	480,248
Transition Zone		2	29,620
Colorado Plateau	Canyonlands	45	1,913,890
Colorado Plateau	High Plateaus	15	229,898
Colorado Plateau	Uinta Basin	9	582,178
Totals		83	3,235,834

Source: WSA Analyses.

Refer to the Mineral and Energy Resources section of this chapter for a description of the potential mineral values of the geologic formations of the WSAs.

SOILS

Soil types in Utah resulted from the area's climate, topography, vegetation, parent material, and time. Within Utah there are seven soil orders (Utah State University, 1975). The most extensive are the Mollisols and Aridisols. Mollisols are dark-colored soils that are usually moist, while Aridisols are light-colored soils that are usually dry. The Entisol Order, light-colored soils that lack development, are also important in Utah. These orders are further broken down into major associations for better identification and interpretation purposes. (A soil association is a group of soils and/or land types geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.)

Although 71 associations have been identified in Utah, WSAs primarily contain miscellaneous land types. These include the light-colored soils of the valleys, terraces, and mesas, and the dominantly dark-colored soils of the mountains, plateaus, and mountain valleys. The following is a brief description of major soil associations.

Miscellaneous Land Types

These areas are characterized by shallow, undeveloped soils and make up more than 50 percent of the WSAs' acreage. Land types include Rock Land, Badland-Rock Land, Rock Land of high mountains, and Playas. These types occur throughout the State within a wide range of elevations and climates. They are mostly

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used for watershed, recreation, and wildlife habitat. Livestock grazing is generally restricted to the more accessible and productive soil types.

The Rock Land Association is located primarily in southeastern Utah. Over 50 percent of all WSAs are partially within this association. Bare rock makes up 50 to 70 percent of this association.

The Badland-Rock Land Association consists mainly of barren shale or interbedded sandstone and shale. This association is most extensive in Carbon, Emery, Grand, and San Juan Counties.

The Rock Land Association of the high mountains occurs mainly on steep to very steep rocky colluvial areas above timberline. Only small areas of the Deep Creek Mountains and the Henry Mountain WSAs occur in this association.

- Dominantly Light-Colored Soils of the Valleys, Terraces, and Mesas

These soils are usually dry, but are moist in some parts during the summer. These are primarily located in eastern Utah. They occur in drainage systems, on terraces, alluvial fans, mesas, and floodplains, particularly along the Colorado, San Juan, and Virgin Rivers. Native vegetation consists of pinyon-juniper, big sagebrush, and associated grasses. These soils are mainly used as range and wildlife habitat.

- Dominantly Dark-Colored Soils of the Mountains, Plateaus, and Mountain Valleys

These soils occur primarily in north-central Utah. The higher elevations of the West Desert WSAs contain this soil type. These soils are usually dry during summer months and moist during winter. Vegetation consists mainly of shrubs and grasses. These soils are used mainly for range, wildlife habitat, and watershed.

No WSAs occur in the Playa Association.

Soil erosion occurs naturally throughout Utah due to wind, water, and freeze-and-thaw cycles. Erosion rate increases or declines are primarily determined by slope, surface disturbance, and soil surface characteristics. Table 33 shows the acreages of erosion classes for BLM lands in Utah and the WSAs.

Table 33
Erosion Classes for BLM Lands in Utah

Erosion Class	Utah BLM- Administered Land		BLM WSAs		
	Acre Each Class	Percent In Class	Acre In Class	Percent of WSAs in Class	Percent of Class in WSAs
Stable	1,200,000	5.5	645,011	20	53.7
Slight	9,033,000	40.9	1,509,423	46	16.7
Moderate	7,300,000	33.1	804,096	25	11.0
Critical	2,370,000	10.7	244,397	8	10.3
Severe	44,000	0.2	25,547	1	58.0
Uninventoried or Unclassified	2,121,595	9.6	7,360	Less Than 1	0.4
Total	22,068,595	100.0	3,235,834	100	

Source: USDI, BLM, 1988b and Volumes II thru VI.

Re seeding and Rehabilitation Potential

The potential for rehabilitation of disturbed areas varies greatly from soil type to soil type within each WSA. Generally, the valley bottoms, terraces and mesa areas which have better developed soils have a greater potential for rehabilitation than the shallow, stoney loams, coarse sands soil types. In many WSAs, rehabilitation is limited to isolated pockets of accumulated soil. Slope, soil depth aspect, and elevation are major limiting factors which affect rehabilitation success. Rehabilitation requirements are determined on a site specific basis as the need for rehabilitation arises.

A total of approximately 2,696,000 acres (83 percent) under study are considered to be unsuitable for vegetation alteration and re seeding. The remaining 539,834 acres (17 percent) range from poor to good in terms of re seeding potential and only 34,450 acres (1 percent) of re seedable land would actually produce a good seeding. Those plots that are re seedable usually are scattered throughout the individual WSAs and encompass small acreages. Even though the majority of the areas are unsuitable for vegetation treatment and re seeding, disturbed areas can be rehabilitated and revegetated through special measures such as: stock piling and replacement of topsoil, irrigation, placement of soil and water retention dams, mulching, and the planting of shrubs and trees, etc.

Soil Salinity

Table 34 shows the estimated salinity class of soils in the Colorado River portion of the BLM WSAs. Approximately 34 percent of the acreage of WSAs in the Colorado River drainage basin has moderate to highly saline soils. The WSA acreage comprises 3.7

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percent of the upper and 0.2 percent of the lower Colorado River drainage basin. About 464,280 acres or 14 percent of the BLM WSA acreage is in the Great Basin, where saline soils have no effect on the salinity of the Colorado River.

Table 34
Estimated Soil Salinity Class of Utah
WSAs in the Colorado River Drainage

Class	Acres
High	500,799
Moderate	446,816
Slight	1,059,317
Non-Saline	<u>764,622</u>
Total	2,771,554 ^a

Source: Volumes II through VI.

^aDoes not include 464,280 acres of WSAs that drain to the Great Basin.

VEGETATION INCLUDING SPECIAL STATUS SPECIES

Vegetation in Utah varies widely due to the State's broad range of climate, soils, and topography. Generally, vegetation can be grouped based on the characteristics of Utah's major ecoregions. These include the Middle Rocky Mountain subdivision of the Rocky Mountain Forest Ecoregion, the Colorado River Plateaus subdivision of the Colorado Plateau Ecoregion, the Basin and Range Area of the Intermountain Sagebrush Ecoregion, and the American Desert Ecoregion.

Utah's Major Ecoregions

• Middle Rocky Mountains

The Middle Rocky Mountains is a subdivision of the Rocky Mountain Forest Ecoregion (USDI, USGS, 1978). This area is located in the Uinta and Wasatch ranges in northern and central Utah. Elevations range from 4,500 to over 13,500 feet, while local relief extends from 3,000 to 7,000 feet.

Vegetation of the Middle Rocky Mountains has distinct zones. At the highest elevations, the alpine tundra zone is above timberline. Below timberline, the subalpine zone is dominated by Englemann spruce and subalpine fir. The next lower zone, the montane, is characterized by stands of Ponderosa pine and Douglas fir. Intermingled with these species, in areas that have

been subject to fire, are stands of aspen and lodgepole pine. On dry, rocky slopes within the montane zone are pinyon-juniper woodland, Gambel's oak, and mountain mahogany. Open, unforested parks or openings occur widely within the Middle Rocky Mountains. Many of these openings are dominated by grasses; others are covered by sagebrush or other shrubs.

• Colorado River Plateau Subdivision

This subdivision of the Colorado Plateau Ecoregion includes vegetation typical of the plateaus, mesas, and canyons of southern and eastern Utah (USDI, USGS, 1978). Utah's largest rivers, the Colorado and the Green, have created steep-walled canyons and high mesas throughout the extensive, relatively flat plateaus of this area. Elevation of plateau tops ranges from 5,000 to 7,000 feet, while local terrain differs by as much as 3,000 feet in some of the deeper canyons that dissect the region.

Vegetation of this subdivision includes several zones. Because only a few mountains rise above timberline, the alpine zone is very limited in extent. The next lowest, the subalpine zone, is characterized by Englemann spruce and subalpine fir. The montane zone found on the high plateaus and mountain slopes covers a relatively small area. Douglas fir and Ponderosa pine grow in the montane along with large stands of aspen. The pinyon-juniper woodland zone, located lower than the montane zone, is the most extensive in the subdivision. Large areas dominated by shrubs are also common.

• Basin and Range Area

This area consists of wide, treeless valleys separated by north-south mountain ranges. Commonly known as the Great Basin, this area covers most of western Utah. It receives little rainfall and is arid to semiarid. With the exception of the mountain ranges, the region is generally between 4,000 to 5,000 feet in elevation. Local topographic differences may be as much as 6,000 feet from valley bottoms to mountain tops.

Nearly all the Basin and Range Area is within the Intermountain Sagebrush Ecoregion (USDI, USGS, 1978). It is dominated by various species of sagebrush and associated plant species. Important shrubs include shadscale, winterfat, four-wing saltbush, rabbitbrush, spiny hopsage, and horsebrush. Most of the plants can tolerate the alkaline and poorly drained soils found in the region. Saltbush and greasewood predominate in valley areas with concentrated salts.

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Pinyon-juniper woodlands are commonly found in foothills above valleys. Farther upslope, where climate permits, stands of Ponderosa pine are present, while at higher elevations and on northeasterly aspects, Ponderosa pine gives way to Douglas fir. Only a few mountains are high enough to support subalpine and alpine zone vegetation.

- American Desert Ecoregion

This ecoregion extends into a small portion of southwestern Utah (USDI, USGS, 1978). Vegetation is sparse, and plants are generally separated by large areas of bare soil. The most widely found plant species in the area is the creosote bush. Other desert shrubs and Cacti also are present. The Joshua tree is common in some areas. With the exception of pinyon-juniper woodland at the highest elevations, vegetation on the mountains in this area is scarce.

Existing Vegetation Types Within WSAs

The four main vegetation ecoregions within Utah, as reviewed above, contain a wide range of vegetation types. Significant variety in vegetation is found within the 83 WSAs due to their geographic distribution and wide ranges in elevation, moisture, and soil types. However, because the WSAs are concentrated in southern Utah and the West Desert, vegetation variety does not parallel the State's variety as a whole. While nearly all vegetation types are represented, most vegetation within the WSAs is representative of the Colorado River Plateau Subdivision and Basin and Range Area. Twenty-eight vegetation types are found within the WSAs. Table 35 lists these types and gives the total estimated acreage of each type. Over half of the vegetation in the WSAs is comprised of various mixes of pinyon-juniper woodland with other species.

Potential Natural Vegetation Within WSAs

Potential natural vegetation (PNV) refers to the vegetation that would exist if plant succession were allowed to reach climax without human interference. The distribution of PNV types within the WSAs is discussed in the Wilderness Values section of this chapter.

Special Status Plant Species

Special status plant species are defined as those species listed as threatened or endangered by FWS, species that are proposed for listing as threatened or endangered, Category 1 and 2 candidate species, and otherwise sensitive species (see Appendix 4).

Table 35
Existing Vegetation Types in WSAs

Vegetation Type	Acres in WSAs
Pinyon-Juniper/Woodland	1,373,594
Pinyon-Juniper/Mountain Shrub	12,832
Pinyon-Juniper/Sagebrush	30,610
Pinyon-Juniper/Blackbrush	14,269
Pinyon-Juniper/Grasses	35,526
Pinyon-Juniper/Desert Shrub	61,617
Pinyon-Juniper/Douglas Fir	110,959
Juniper	74,953
Sagebrush	97,391
Sagebrush-Horsebrush	67,483
Sagebrush-Grassland	18,575
Greasewood	2,252
Ephedra	6,208
Shadscale	90,948
Saltbush	14,101
Mountain Mahogany	9,773
Mountain Shrub	57,790
Desert Shrub	313,825
Blackbrush	159,961
Desert Shrub-Sagebrush	12,220
Desert Shrub-Saltbush	11,410
Pickleweed-Saltgrass	3,465
Grasses	48,117
Coniferous Forest/Aspen	60,896
Oak-Ponderosa Pine	41,294
Douglas Fir	88,830
Riparian	23,775
Barren	393,160
Total	3,235,834

Source: Volumes II thru VI WSA Analyses.

In Utah, 16 plant species are listed as endangered or threatened (USDI, FWS, 1989). Eight listed endangered or threatened species are known to or may occur in 19 WSAs. These plant species and the WSAs in which they may occur are identified in Table 36.

In addition to the listed threatened or endangered species, there are currently 103 Category 1 and 2 candidate plant species in Utah. Forty-four of these species are known to or may occur in 69 of the WSAs. Appendix 4 lists these species and the WSAs in which they may occur.

There are also 10 rare, endemic, or otherwise sensitive plant species that are known or thought to occur in 16 WSAs. These are species that are not listed as endangered, threatened, or as candidates. They are, however, of management concern to BLM (see Appendix 4 for a listing of these species and the WSAs in which they may occur. It is BLM policy to protect, conserve, and manage and protect all special status species.

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Table 36
Known and Potential Occurrence of Listed
Threatened or Endangered Plant Species in BLM WSAs

Common Name	Scientific Name	WSA
Welsh's milkweed	<u>Asclepias welshii</u>	Moquith Mountain
Wright's fishhook cactus	<u>Scelerocactus wrightiae</u>	Mt. Ellen-Blue Hills, Fiddler Butte, Mt. PEnnell, Mt. Hillers, Little Rockies, San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
Spineless hedgehog cactus	<u>Echinocereus triglochidiatus</u> <u>var. inermis</u>	Bridger Jack Mesa
Jones Cycladenia	<u>Cycladenia humilis</u> <u>var. jonesii</u>	Behind the Rocks, Mill Creek Canyon, Negro Bill Canyon, San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
Maguire daisy	<u>Erigeron maguirei</u> <u>var. maguirei</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
San Rafael cactus	<u>Pediocactus despainii</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
Last Chance Townsendia	<u>Townsendia aprica</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
Uinta Basin hookless cactus	<u>Sclerocactus glaucus</u>	Desolation Canyon

Source: Individual WSA Analyses and Appendix 4.

WATER RESOURCES

Water Supplies

Surface water supplies for the State are extremely variable. The mean annual surface water supply for Utah is about 8.5 million acre-feet. More than half of the runoff (4.9 million acre-feet) drains to the Great Basin and the remainder (3.6 million acre-feet) drains to the Colorado River Basin. The average amount of surface water per square mile in Utah is 25 percent of the average for the United States.

Surface water generally is more plentiful in the higher elevations of the Wasatch and Uinta mountains than in the other parts of the State. In the south and southeastern parts of the State, high intensity, cloudburst-type storms produce rapid flood runoff for short periods during July, August, and September. In addition to large variations in water supplies (both in quantity and quality) from one location to another, surface wa-

ter varies greatly on a seasonal, yearly, and cyclic basis.

Forty-one of the WSAs have little or no perennial surface water, although 10 WSAs have moderate amounts of surface water primarily in the spring season; and 42 WSAs have perennial surface water. Nine of the 42 WSAs with perennial waters are headwater areas where the major drainages originate within the boundaries of the WSAs. Thirty-three have creeks or rivers originating outside of, but passing through or bordering the WSAs. WSAs with perennial streams are listed in Table 37. Overall, there are 719 miles of perennial streams in or bordering BLM WSAs.

The water situation is summarized for headwater WSAs in Table 38 and for non-headwater WSAs in Table 39.

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Table 37
Perennial Streams Within WSAs

Map Reference Number	WSA	Water Supply	Total Miles of Perennial Stream
3	Deep Creek Mountains	Birch Creek, Trout Creek, Indian Farm Creek, Thoms Creek, and Granite Creek	22
12	Cougar Canyon	Cougar Canyon, Sheep Canyon, Sheep Corral Canyon, Pine Park Canyon, and Headwaters Wash	7
16	Deep Creek Canyon	Deep Creek, Kolob Creek, North Fork Virgin River	5
17	North Fork Virgin River	North Fork Virgin River	1.5
19	Parunuweap Canyon	East Fork Virgin River	10
20	Canaan Mountain	South Creek and Horse Valley Wash	4
21	Moquith Mountain	Water Canyon	8
22	The Blues	Henrieville Creek and Henderson Creek	5
23	Mud Spring Canyon	Henrieville Creek, Dry Valley Creek, and Little Creek	4
24	Paria-Hackberry	Paria River, Cottonwood Creek, and Hackberry Creek	50
25	The Cockscomb	Paria River	3
29	Phlipps-Death Hollow	Escalante River, Calf Creek, Pine Creek, Sand Creek, Sweetwater Creek, Willow Patch Creek, Mamie Creek, and Death Hollow Creek	40
30	Steep Creek	Deer Creek, Steep Creek, and The Gulch	15
31	North Escalante Canyons/The Gulch	Escalante River, Boulder Creek, Deer Creek, The Gulch	42
33	Scorpion	Twenty-five Mile Wash	6
35	Fifty Mile Mountain	Rogers Canyon	1
36	Mt. Ellen-Blue Hills	Bull Creek, Dugout Creek, Oak Creek, Birch Creek, and South Creek	23
38	Dirty Devil	Dirty Devil River	30
41	Fiddler Butte	Dirty Devil River	4
43	Mt. Pennell	Coyote Creek, Dark Canyon, Straight Creek, Brown's Creek, and Bullfrog Creek	10.5
43	Mt. Hillers	Copper Creek, Benson Creek, and Gold Creek	3
44	Little Rockies	Trachyte Creek	6
48	Fish Creek Canyon	Fish Creek	5
51	Dark Canyon	Dark Canyon	10
54	Indian Creek	Indian Creek	4
56	Mill Creek Canyon	North Fork Mill Creek, Rill Creek, and Buckholder Draw	20
57	Negro Bill Canyon	Negro Bill Creek	6
58	Horseshoe Canyon (North)	Green River and Barrier Creek	20
60	Crack Canyon	Muddy Creek	2.5
61	Muddy Creek	Muddy Creek	20
63	Sids Mountain	San Rafael River and North Salt Wash	24
64	Mexican Mountain	San Rafael River	34
66	Desolation	Green River, Range Creek, Coal Creek, Jack Creek, Price River, Rock Creek, and Flat Creek	207
67	Turtle Canyon	Little Park Wash and Mitches Canyon	10
68	Floy Canyon	Floy Wash	8
69	Coal Canyon	Cottonwood Creek	8
70	Spruce Canyon	Diamond Creek and Cottonwood Creek	15
71	Flume Canyon	Diamond Creek	7.5
72	Westwater Canyon	Colorado River	13
B	Spring Creek Canyon	Spring Creek and Kannara Creek	2.5
G	Fremont Gorge	Sulphur Creek	2.0
I	Daniels Canyon	Cub Creek	0.5
Total			719.0

Source: WSA Analyses.

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Table 38
Water Situation Summary Headwater WSAs^a

WSA	Perennial Streams	Stream Status	Known Springs and Seeps	Spring and ^b Seep Status	Upstream ^c Ownership
North Stansbury Mountains	None	N/A ^d	1	Open	None
Cedar Mountains	None	N/A	3	Appropriated	None
Fish Springs	None	N/A	1	Open	None
Rockwell	None	N/A	None	Open	none
Swasey Mountains	None	N/A	None	Open	None
Howell Peak	None	N/A	None	Open	None
Conger Mountain	None	N/A	1	Open	None
Notch Peak	None	Open ^e	None	Open	None
King Top	None	N/A	None	Open	None
Wah Wah Mountains	None	N/A	None	Open	None
Red Mountain	None	N/A	None	Appropriated	None
Canaan Mountain	2	Appropriated	12	Appropriated	None
Moquith Mountain	1	Appropriated	5	Appropriated	None
Wahweap	None	N/A	24	Appropriated	None
Burning Hills	None	N/A	1	Appropriated	None
Escalante Canyons Tract 5	None	N/A	None	Appropriated	None
Fifty Mile Mountain	1	Appropriated	34	Appropriated	None
Mt. Ellen-Blue Hills	5	Appropriated	25	Open	None
Bull Mountain	None	N/A	3	Open	None
French Spring-Happy Canyon	None	N/A	1	Open	None
Mt. Pennell	5	Appropriated	16	Open	None
Mt. Hillers	3	Appropriated	3	Open	None
Mancos Mesa	None	N/A	8	Open	None
Bridger Jack Mesa	None	N/A	None	Open	None
Behind The Rocks	None	N/A	1	Open	None
Devils Canyon	None	N/A	None	Open	None
Jack Canyon	None	N/A	12	Open	None
Coal Canyon	1	Appropriated	22	Open	None
Spruce Canyon	2	Appropriated	None	Open	None
Flume Canyon	1	Appropriated	None	Open	None
Winter Ridge	None	N/A	12	Open	None
Red Butte	None	N/A	0	Appropriated	None
The Watchman	None	N/A	0	Appropriated	None
Deep Creek Mountains	5	Appropriated	6	Open	Goshute Indian Reservation
Cougar Canyon	5	Appropriated	7	Appropriated	Dixie National Forest
Cottonwood Canyon	None	N/A	None	Appropriated	Dixie National Forest
LaVerkin Creek Canyon	None	N/A	None	Appropriated	Dixie National Forest and Private Lands

Source: USDI, BLM, 1988; and UDNRE, DWR, 1987, 1988a, and 1988b.

^aIn Headwater WSAs major drainages originate inside the WSA boundaries. Small or ephemeral streams may originate short distances upstream of the WSA.

^bIsolated springs and seeps are open to appropriation not to exceed 0.015 cfs. The known springs and seeps may already be fully appropriated.

^cIndicates the ownership of lands traversed by perennial and ephemeral drainages upstream of the WSAs. State of Utah lands are likely involved in all major drainages.

^dN/A = Not Applicable.

^eAn intermittent drainage previously used in mining operations may be open to appropriation in the Notch Peak WSA.

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Table 39
Water Situation Summary Non-Headwater WSAs^a

WSA	Perennial Streams	Stream Status	Known Springs and Seeps	Spring and ^b Seep Status	Upstream ^c Ownership
Deep Creek Canyon	3	Appropriated	None	Appropriated	Dixie National Forest and Private Lands
North Fork Virgin River	1	Appropriated	None	Appropriated	Dixie National Forest
Orderville Canyon	None	N/A	None	Appropriated	Private Lands
Parunuweap Canyon	1	Appropriated	3	Appropriated	Private Lands
The Blues	2	Appropriated	3	Appropriated	Dixie National Forest
Mud Spring Canyon	3	Appropriated	6	Appropriated	Dixie National Forest
Paria-Hackberry	3	Appropriated	24	Appropriated	Dixie National Forest, Private Lands, and Bryce Canyon National Park
The Cockscomb	1	Appropriated	None	Appropriated	Dixie National Forest and Private and Public Lands
Death Ridge	None	N/A	1	Appropriated	Dixie National Forest and Private and Public Lands
Phipps-Death Hollow	8	Appropriated	6	Appropriated	Dixie National Forest and Private and Public Lands
Steep Creek	3	Appropriated	4	Appropriated	Dixie National Forest and Private and Public Lands
North Escalante Canyons/ The Gulch	6	Appropriated	17	Appropriated	Dixie National Forest and Private and Public Lands
Carcass Canyon	None	N/A	4	Appropriated	Public and State Lands
Scorpion	1	Appropriated	6	Appropriated	Public Lands
Dirty Devil	1	Open ^d	15	Open	Manti-LaSal National Forest and Private and Public Lands
Horseshoe Canyon (South)	None	N/A	9	Open	Private and Public Lands
Fiddler Butte	1	Open	2	Open	Manti-LaSal National Forest
Little Rockies	1	Appropriated	1	Open	Public and Private Lands
Grand Gulch	None	N/A	26	Open	Public and State Lands
Road Canyon	None	N/A	4	Open	Manti-LaSal National Forest and Public and Private Lands
Fish Creek Canyon	1	Appropriated	11	Open	Manti-LaSal National Forest and Public and Private Lands
Mule Canyon	None	N/A	None	Open	Manti-LaSal National Forest and Public and Private Lands
Cheesebox Canyon	None	N/A	1	Open	Manti-LaSal National Forest and Public Lands
Dark Canyon	1	Appropriated	Several	Open	Manti-LaSal National Forest, Canyonlands National Park, and Private Lands
Butler Wash	None	N/A	Several	Open	Public Lands
Indian Creek	1	Appropriated	1	Open	Manti-LaSal National Forest, Canyonlands National Park, and Private Lands
Mill Creek Canyon	3	Appropriated	1	Open	Manti-LaSal National Forest
Negro Bill Canyon	1	Appropriated	7	Open	Manti-LaSal National forest
Horseshoe Canyon (North)	2	1 Open and 1 Appropriated	3 developed, several others	Open	Glen Canyon National Recreation Area and Public and State Lands
San Rafael Reef	None	N/A	22	Open	Public Lands
Crack Canyon	1	Appropriated	Several	Open	Public Lands
Muddy Creek	1	Appropriated	1	Open	Manti-LaSal National Forest and Private and Public Lands
Sids Mountain	2	Appropriated	11	Open	Manti-LaSal National Forest and Private and Public Lands
Mexican Mountain	1	Appropriated	23	Open	Manti-LaSal National Forest and Private and Public Lands

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Table 39 (Continued)
Water Situation Summary Non-Headwater WSAs^a

WSA	Perennial Streams	Stream Status	Known Springs and Seeps	Spring and ^b Seep Status	Upstream ^c Ownership
Desolation Canyon	6	1 Open and 5 Appropriated	12	Open	Manti-LaSal National Forest, Uinta National Forest, Ouray Indian Reservation, and Private and Public Lands along tributaries in Wyoming, Utah, and Colorado.
Turtle Canyon	2	Appropriated	10	Open	Private and Public Lands
Floy Canyon	1	Appropriated	86	Open	Uinta and Ouray Indian Reservation
Westwater Canyon	1	Open	0	Open	Private and Public Lands in Colorado and Utah
Spring Creek Canyon	2	Appropriated	1	Appropriated	Zion National Park and Private Lands
Taylor Creek Canyon	None	Appropriated	None	Appropriated	Private Lands
Goose Creek Canyon	None	Appropriated	None	Appropriated	Private Lands
Beartrap Canyon	None	Appropriated	None	Appropriated	Private Lands
Fremont Gorge	1	Appropriated	None	Open	Fish Lake National Forest and Private Lands
Lost Spring Canyon	None	Appropriated	Several	Open	Arches National Park
Daniels Canyon	1	Appropriated	2	Open	Dinosaur National Monument and Private Lands
South Needles	None	N/A	1	Open	Canyonlands National Park and Public Lands

Source: USDI, BLM, 1988; and UDNRE, DWR, 1987, 1988a, and 1988b.

^aIn Non-Headwater WSAs major drainages originate outside of the WSA.

^bIsolated springs and seeps are open to appropriation not to exceed 0.015 cfs. The known springs and seeps may already be fully appropriated.

^cIndicates the ownership of lands traversed by perennial and ephemeral drainages upstream of the WSAs. State of Utah lands are likely involved in all major drainages.

^dN/A = Not Applicable.

^eAn intermittent drainage previously used in mining operations may be open to appropriation in the Notch Peak WSA.

^fPerennial streams shown as open to one-time or fixed applications in excess of 0.015 cfs.

^gSeveral springs indicate springs are known in the area but an exact inventory has not been done.

Water Allocation

In Utah, 72 of the WSAs (2,771,554 acres) are within the Colorado River drainage basin. The Colorado River Basin includes portions of seven states and Mexico. The river's water, now and in future years, has been fully allocated between states through a long history of appropriations and negotiations that include acts, compacts, decrees, and an international treaty (USDI, BOR, 1986; Hansen, 1976; and National Academy of Sciences, 1968).

The Colorado River drainage is administratively divided into the Upper (70,131,200 acres) and the Lower (86,028,800 acres) Basins, or hydrologic subregions (Hansen, 1976 and National Academy of Sciences, 1968). The Upper Colorado River Basin is comprised of the drainage area above Lees Ferry, Arizona. Utah

is one of the Upper Colorado River Basin States. Approximately 2,620,488 acres of BLM WSAs drain into the Upper and 151,066 acres drain into the Lower Colorado River Basin.

In addition to State laws that provide for intrastate control of water, use of water in the Upper Colorado River Basin is administered by three significant documents. These are: the Colorado River Compact of 1922, the Mexican Treaty of 1944, and the Upper Colorado River Basin Compact of 1948 (Hansen, 1976).

Utah has been apportioned about 23 percent (or about 1.4 to 1.7 million acre-feet) of the water available to the upper basin for annual use (Hansen, 1976). Current annual consumptive use of this allotment is less

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than 1 million acre-feet, although many additional water filings exist.

The Green River drainage is the major tributary of the Colorado River in Utah, and the Green River is very important to Utah's allocated share of the water. The Green River is commonly referred to as being "over-subscribed," but since many water filings have not been acted on, the river is considered as not fully appropriated by the State Water Rights Office. Temporary and fixed time applications for more than 0.015 cubic feet per second (CFS) on the Green River could be considered (UDNRE, DWR, 1988).

Entitlements of the Ute Indians under the 1908 Winters Doctrine would be included in the Utah water use in the Colorado River Basin. Quantification of the Indian water rights has been under discussion between the State and the Tribe for many years and has yet to be officially determined.

Apportionment under the Upper Colorado River Compact provides for water diversion and use of water from the Colorado River tributaries in Wyoming and Colorado, which affects flows entering Utah.

Numerous water storage projects exist in the Upper Colorado River Basin. These are operated on a system program which accounts for downstream projects and water delivery requirements consistent with the legal requirements of the governing documents noted above.

Various projects may be constructed in the future, in order for each of the Upper Basin States to use its entitlement under the compact. This may include projects to transfer water between subbasins or out of the Colorado River Basin. Future projects would have to take into account the following factors: (1) the releases required to accommodate operation of the downstream dams, (2) existing Federal reserved water rights which may be associated with existing national parks, (3) the amount of water which must be allowed to flow to the lower Colorado River Basin States, and (4) the consideration of water needs for endangered fish species.

The U. S. District Court ruled (*Sierra Club vs. Block*) that Federal wilderness in Colorado carries an implicit water right (U.S. District Court, Colorado, 1985). This ruling created many questions regarding Federal reserved water rights for wilderness purposes. After study by the Department of the Interior Solicitor, the Secretary of the Interior asked the U.S.

Attorney General's Office for concurrence with the Solicitor's Opinion. On July 28, 1988, the Attorney General concluded that no legally sufficient basis exists for an implication of Federal reserved water rights for wilderness purposes (Meese, 1988). Water for wilderness purposes may be provided through express reservations by Congress or may be acquired through State water law. The Attorney General's opinion is that in the absence of express statutory language, the Federal government will not assert reserved wilderness water rights under Federal law in any further litigation, but will seek water for wilderness purposes where appropriate under State law. However, in Utah, rights for instream purposes such as recreation, riparian vegetation, and aquatic wildlife are inconsistent with the traditional application of Utah State water laws. Direct conflicts with Utah water laws would be involved with filing for rights for instream flows or for wildlife, scenic, and recreational uses. The only provision for instream flow rights is that an existing perfected water right may be transferred to the UDWR with legislative approval. Any change application then filed by the Division of Wildlife can be considered for approval by the State Engineer (McKinney and Taylor, 1988; and Reiser, et al., 1989).

The streams in 28 of the 33 non-headwater WSAs with perennial streams are fully appropriated (UDNRE, DWR, 1988a). All surface waters are fully appropriated in 13 of these WSAs, while 15 are open to appropriation of isolated springs and seeps, not to exceed 0.015 cfs. In five nonheadwater WSAs, the streams are open to temporary and fixed time applications for amounts in excess of 0.015 cfs (UDNRE, DWR, 1988a). These WSAs are the Dirty Devil and Fiddler Butte (Dirty Devil River), the Desolation Canyon and Horseshoe Canyon North (Green River), and the Westwater Canyon (Colorado River).

Water Uses and Development Projects

Some water sources in WSAs are or have been proposed to be used for irrigation, municipal water, livestock, wildlife, and mineral and energy development.

The Canaan Mountain WSA provides community water to Hilsdale, Utah; and Colorado City, Arizona; the Cottonwood Canyon WSA provides water to St. George and surrounding communities in Utah; and the Moquith Mountain WSA provides community water to Fredonia, Arizona. A pipeline is proposed in the Spring Creek Canyon WSA to deliver water to the town of Kanaraville, Utah. Additional water development for

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community use is proposed in the Canaan Mountain and Cottonwood Canyon WSAs. Reservoirs have been proposed in the Parunuweap, Canaan Mountain, and Cockscomb WSAs and adjacent to the North Fork Virgin River WSA.

Water diversions from Rock Creek have been proposed in the Desolation Canyon WSA. The potential for using groundwater for bitumen (oil) extraction from tar sand has been identified in the French Spring-Happy Canyon and Fiddler Butte WSAs.

Potential hydroelectric dam sites have been identified (Clyde et al., 1979) in the Mexican Mountain, Horseshoe Canyon (North), and Desolation Canyon WSAs. Hydroelectric potentials are discussed in more detail in the Mineral and Energy Resources sections of this chapter. None are predicted to be viable for construction within the foreseeable future (see Appendix 6).

Recreational float boating in seven WSAs and fish habitat are the major nonconsumptive water uses within the WSAs.

The Escalante River, Dirty Devil River, Muddy Creek, Sulfur Creek, San Rafael River, Green River, Price River, and Colorado River traverse or border a total of 11 WSAs and flow through areas upstream of the WSAs where additional water diversion and use are likely in the future.

Utah Power and Light (UP&L) has applications on file with the State Water Engineer for over 200,000 acre feet of water from the Escalante River system (UP&L, 1986). The intended use of this undeveloped water is for coal-fired steam generation, and mining, domestic, and agricultural purposes. Diversion of water for these uses likely would be upstream of the Phipps-Death Hollow and the North Escalante Canyon/The Gulch WSAs.

The Dirty Devil River originates at the confluence of the Fremont River and Muddy Creek. Sulfur Creek is a tributary to the Fremont River. This river system flows through the Dirty Devil, Fiddler Butte, Muddy Creek, Crack Canyon, and Fremont Gorge WSAs after originating in the Manti-LaSal and Fish Lake National Forests and flowing for several miles across public and private lands upstream of the WSAs. It is likely that water eventually will be diverted from these streams in Emery, Sevier, and Wayne Counties above the WSAs for expansion of irrigation, coal-fired steam generation power plants, coal mining, and

other uses. Additional reservoirs also are proposed above the WSAs.

The San Rafael River originates at the confluence of Huntington and Cottonwood Creeks that headwater on the Manti-LaSal National Forest in western Emery County. The San Rafael River then traverses the Sids Mountain and Mexican Mountain WSAs and flows into the Green River. Additional diversions and reservoirs on the San Rafael River system are likely upstream of these WSAs in Emery County. Limited feasibility studies have been conducted for a reservoir at the confluence of Huntington and Cottonwood Creeks to store water for a future coal-fired steam generation plant.

The Price River originates in western Carbon County in the Manti-LaSal National Forest and flows east to its confluence with the Green River inside the Desolation Canyon WSA. The river is used for irrigation, municipal, coal mining, and other industrial purposes, and it is likely that additional diversions or reservoirs would be built upstream of the Desolation Canyon WSA.

The Green River originates in Wyoming and flows through Wyoming, Utah, and Colorado before flowing through the Desolation Canyon WSA. The Green River also forms the northern boundary of the Horseshoe Canyon (North) WSA downstream of the Desolation Canyon. The Colorado River begins in Colorado and flows through Colorado and Utah before traversing the Westwater WSA. Additional reservoirs and diversions upstream of these WSAs are likely.

Water developments for other purposes include 64 springs and seeps, six wells, 23 catchments, and 19 guzzlers for livestock, wildlife, culinary, and other uses (refer to the Livestock and Wildlife Including Special Status Species sections of this chapter for further discussions on proposed livestock and wildlife water projects).

Limited data on groundwater are available for BLM WSAs. Springs, seeps, and wells have been developed in 32 WSAs and a total of 64 spring or seep developments are proposed in 19 WSAs.

Water Quality and Salinity

Water quality in the high mountain WSAs (e.g., Deep Creek Mountains and Turtle Canyon) is considered good, but creeks and rivers in most WSAs are

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generally turbid and water quality is usually marginal to poor.

In the Colorado Plateau region, the main water quality concerns are related to the overall salinity conditions of the Colorado River system, addressed in three Federal laws: (1) the Federal Water Pollution Control Act Amendment of 1972 (PL 92-500), (2) the Colorado River Basin Salinity Control Act of 1974 (PL 93-320), and (3) the Colorado River Basin Salinity Control Act Amendment of 1984 (PL 98-569).

Salinity control within the river system is required to allow the United States to meet its water quality obligations to Mexico.

About half of the present salinity concentration is from natural sources and about half results from activities such as irrigation, reservoir evaporation, exports, and domestic use. High salinity results from: (1) salt loading and (2) salt concentrations. Salt loading adds new material to the water, and salt concentration decreases the amount of water available for dilution. The total salinity of the river system varies somewhat from year to year, depending on the amount of water and the various activities. The salinity increases as the rivers flow downstream, due to water diversion, evaporation, and salt contributions (USDI, BOR, 1986).

In Utah, the areas which contribute most to downstream salinity are the Uintah Basin, the Price and San Rafael River Basins, and the Dirty Devil River Basin. Salinity control measures have been identified for each of these areas. Also, to a lesser extent, the Escalante, Paria, and Virgin rivers contribute to downstream salinity.

The Dirty Devil River empties directly into the Colorado River (Lake Powell). The Uintah Basin, the Price River, and the San Rafael River enter the Green River which is a major tributary of the Colorado River. The Green River is considered to be rated as slightly saline, according to established salinity classes (USDI, BLM, 1978b). Salinity conditions of the Green River at Green River, Utah; have an average recorded historical (1973 to 1984) level of 456 (mg/l) (USDI, BLM, 1987).

The following Utah BLM land use plans address Colorado River salinity: Diamond Mountain, Grand, San Juan, Price River, San Rafael, Kanab, and Escalante. Generally, the BLM land use plan includes management objectives to increase vegetative cover and to avoid

increased erosion in highly saline areas. No salinity control projects are planned for water sources or rivers within any of the WSAs. Diffuse source salinity control activities are planned for the Dirty Devil River and the San Rafael-Price River unit under the Water Quality Improvement Program, which would include reduction of saline irrigation return flows upstream from the WSAs (USDI, BOR, 1986).

Salinity is not considered to be a significant matter relative to wilderness designation or nondesignation in any of the 83 WSAs.

Surface waters of Utah are grouped into beneficial use classes to protect uses against controllable pollution. Water quality standards have been set as follows: Class 1: protected for domestic uses; Class 2: protected for recreational use and aesthetics; including swimming, boating, water skiing, and similar uses; Class 3: protected for use by aquatic wildlife; Class 4: Protected for agricultural uses including irrigation of crops and livestock watering; Class 5: reserved; and Class 6: protected for special uses on a case-by-case basis.

Various waters within the BLM WSAs range from Class 1 to Class 4. Most of the springs in the BLM WSAs are protected under Class 4. Fisheries are protected under Class 3 in 12 WSAs. Class 1 waters include springs in the Canaan Mountain, Moquith Mountain, and Spring Creek Canyon WSAs and portions of streams in the Virgin and Green River drainages. Class 2 is also applied to portions of the Virgin, Green, and Colorado River drainages inside WSAs. It is illegal to discharge or place wastes or other substances in these waters that would exceed the standards of the beneficial use class.

MINERAL AND ENERGY RESOURCES

Specific information available on mineral and energy resource values within WSAs is limited. Because the wilderness Act and the FLPMA specifically require assumption of mineral values, and in order to provide comparable data on potential mineral values for WSAs, BLM contracted with the U.S. Department of Energy (USDOE) and Science Applications, Inc. (SAI). The resulting information (SAI, 1982) was the source of most minerals and energy data presented in the Draft EIS. Several government publications were also used for reference material. Where other specific data were available, it was presented in the individual WSA analyses (Volume II through VI) and supplemented the SAI information.

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In most cases, SAI data are based on interpretation of geologic maps, reports, occurrence and production data, and individual knowledge and projections of a core team of geologists.

The SAI estimates of mineral and energy resources were based on a two-part rating system. The first rating (e.g., "f3") estimates the geologic favorability (f) of the tract for the resource. The second rating (e.g., "c2") is an estimate of degree of certainty (c) that the resource actually does or does not exist within each WSA. Favorability and certainty are rated on a scale of 1 to 4, where 1 is low and 4 is high. Each "f" rating is correlated with a projected amount for each resource that could occur within the boundaries of each WSA. For example, an f2 rating for oil and gas indicates that up to 10 million barrels of oil and/or 60 billion cubic feet of natural gas could be in place within the WSA. The certainty with which the projection is made is indicated by the "c" rating. Where WSAs are adjacent and would probably be part of the same oil and gas field or mineralized area, it is unlikely that each WSA would contain the projected amounts. (Refer to Appendix 5 for a more detailed discussion of the SAI rating system.)

Estimates of mineral quantities and importance could change with new field data, economic conditions, or changes in extraction technology. In some instances, representatives of mineral and/or energy companies or other interests did not agree with the SAI ratings. The industry views generally ranked the mineral potential of selected WSAs at a higher level than SAI, while others thought that the ratings were too high.

In response to comments received on the Draft EIS relative to the feasibility of potential mineral development, mineral data presented in that document have been carefully reviewed by a team of BLM geologists. The geologists reviewed the original SAI ratings for each WSA and modified those ratings where additional data indicated that a modification was justified. Information compiled by BLM, other Federal agencies, and private industry, since the original SAI study was completed, has been factored into the individual WSA ratings. In some instances, this new data raised the favorability and certainty of minerals occurring in individual WSAs, while, at the same time, it increased the certainty that specific minerals do not occur in other WSAs.

Concurrent with the review and updating of the favorability/certainty ratings for each WSA, a separate study was conducted to project the anticipated de-

mand for mineral commodities known to occur in the WSAs for the foreseeable future. Once the updated ratings for minerals in the individual WSAs were completed, the ratings were tabulated on a Statewide basis. These tabulations, along with the demand projections for each commodity, were combined to make determinations as to where mineral and energy resources most likely would be developed. For some mineral commodities, particularly the locatable minerals, projections were made for both exploration and possible extraction of the mineral resource. Appendix 6 describes mineral and energy resource exploration and extraction projections by mineral commodity.

Also, the mineral importance of WSAs recommended as suitable is being reviewed by the USGS and USBM in independent mineral investigation reports. The Final EIS incorporates data from these reports for WSAs for which they are available. BLM and the Secretary of the Interior will consider the USGS and USBM reports prior to making final wilderness recommendations. USGS and USBM reports will be made available to the public and will be submitted to the President and Congress as required by the FLPMA.

Mineral Significance of WSAs

The following information indicates the significance of minerals potentially found in the WSAs as compared to national and State perspectives. Table 40 lists national production of mineral and energy resources, Table 41 lists the mineral and energy production within the State of Utah, and Table 42 identifies past or existing mineral and energy production from Utah WSAs.

Many WSAs have known or suspected potential minerals. Estimated mineral reserves on a national and State basis are summarized in Table 43. Mineral supply forecasts are based on proven reserves. These forecasts show that some mineral reserves may last only one or two generations at expected consumption levels. However, reserves may increase due to the discovery of new minable deposits or improvements in technology for retrieving and processing previously uneconomic deposits.

The total reserve base includes those minerals that are currently economic (reserves), marginally economic. Reserves are part of the resource base that could be economically extracted or produced at the current time, whereas marginal reserves border on being economically producible at this time.

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Table 40
U.S. Production of Mineral and Energy Resources

Item	Unit U. S. Production	Year				
		1984	1985	1986	1987	1988
Oil	Thousand barrels/day	8,879	8,980	8,800	8,250	8,100
Gas	Billion cubic feet	17,392	16,383	15,967	15,893	15,789
Tar Sand	Barrels	None	None	None	None	None
Oil Shale	Barrels	570,000 Between 1976 through 1988				
Coal	Million short tons	896	884	890	919	940
Potash	Thousand metric tons	1,600 ^a	1,296	1,202	1,262	1,520
Phosphate	Thousand metric tons	49,197	50,835	40,320	40,964	46,000
Geothermal	Megawatts	7,741	9,325	10,307	10,775	N/A ^c
Hydropower	Gigawatts	321,150	281,100	291,200	303,100	308,300
Uranium	Million pounds of U ₃ O ₈	13.6	8.6	8.3	6.0	N/A
Vanadium	Thousand pounds of vanadium content	3,234 ^a	W ^b	W	W	W
Copper	Thousand metric tons	1,103 ^a	W ^b	W	W	W
Gold	Million troy ounces of gold content	2.08 ^a	2.43	3.74	4.97	6.6
Silver	Million troy ounces of silver content	44.6 ^a	39.4	34.5	39.8	45.0
Lead	Thousand metric tons	335	424	353	319	390
Zinc	Thousand metric tons	253 ^a	227	203	217	245
Manganese	Thousand short tons	None	None	None	None	None
Beryllium	Short tons of contained beryllium	241	230	261	242	280
Tungsten	Metric tons	1,173 ^a	983	817	34	230
Mercury	76-pound flasks	19,048 ^a	16,530	W ^b	W	W
Barite	Thousand short tons	775 ^a	739	297	448	406
Molybdenum	Thousand lb	103,664 ^a	108,409	93,976	75,117	75,000

Sources: USDOE, Energy Information Administration, 1988; USDI, USBM, 1985.

^aEstimated.

^bWithheld to avoid disclosing proprietary data.

^cN/A = Not Available

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Table 41
Utah Mineral and Energy Production

Resource	Unit	1984	1985	1986	1987	1988
Oil	1,000 barrels	34,689	35,000	35,200	35,788	38,076
Gas	Million cubic feet	74,700	83,400	90,010	87,100	62,300
Tar Sand	Barrels	None	None	None	None	None
Coal	Thousands of short tons	12,323	12,831	14,209	16,521	18,200
Potash	1,000 short tons	N/A	N/A	N/A	90	115
Phosphate	1,000 short tons	N/A	N/A	N/A	883	950
Oil Shale	Barrels	134,000 between 1976 through 1988				
Geothermal	Gigawatt hours	38	110	172	164	170
Hydropower	Gigawatt hours	1,391	1,019	1,413	856	N/A
Uranium	1,000 lb U ₃ O ₈	Wa	Wa	Wa	5,320	3,200
Vanadium		-----Undetermined-----				
Copper	Metric tons	Wa	N/A ^b	N/A ^b	145,124	204,300
Gold	Troy ounces	Wa	135,489	N/A ^b	315,922	406,000
Silver	Thousand troy ounces	Wa	Wa	Wa	4,062	4,320
Lead	Metric tons	Wa	Wa	Wa	Wa	Wa
Zinc	Metric tons	Wa	Wa	Wa	Wa	Wa
Manganese		None	None	None	None	None
Beryllium	Tons of ore	402,000	5,738	6,533	7,000	8,000
Tungsten		-----Undetermined-----				
Mercury		-----Undetermined-----				
Aragonite-onyx		-----Undetermined-----				
Barite		-----Undetermined-----				
Molybdenum		-----Undetermined-----				

Sources: USGS and USBM, File Data.

^aWithheld to avoid disclosure of propriety information.

^bN/A = Not Available.

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Table 42
Past or Existing Mineral and Energy Production
From Utah WSAs

Map Reference Number	WSA	Approximate Minerals Produced	Dates of Production	Approximate Quantities Produced in WSA
1	North Stansbury Mountains	Lead, zinc, silver, gold, and copper	1933 to present ^a	Less than 400,000 lb lead, 5,000 lb zinc, 6,000 troy oz silver, 5 oz gold, and 1,000 lb copper ^b
2	Cedar Mountains	Aragonite-onyx	1890 to present ^a	Small amounts
3	Deep Creek Mountains	Copper, gold, lead, zinc, mercury, silver, beryllium, and molybdenum	1901 to present ^a	Less than 1,710 tons copper, 36,000 oz gold, 2.7 million lb lead, 30,000 lb zinc, 15000 lb mercury, 877,000 troy oz silver, and minor amounts of minerals. ^b
6	Swasey Mountain	Gold	Now inactive	Minor amounts
9	Notch Peak	Gold and tungsten	Now inactive	Minor amounts
22	The Blues	Coal	1952 to 1963	5,300 tons
25	The Cockscomb	Coal	Now inactive	Small tonnage
42	Mt. Pennell	Gold and silver	Now inactive	Minor amounts
58	Horseshoe Canyon (North)	Uranium	1950s	Less than 100 tons of ore.
59	San Rafael	Copper and uranium	1917-1918, 1973	Less than 3 tons copper, 268 metric tons of uranium oxide.
60	Crack Canyon	Uranium	1952 to 1973	Less than 414 tons of uranium oxide.
65	Jack Canyon	Oil and gas (one unitized field)	1976 to present	1,215 million cubic feet of gas since 1981
66	Desolation Canyon	Oil and gas (four unitized fields)	1952 to present	518 million cubic feet of gas since 1982
68	Floy Canyon	Oil and gas (one unitized field)	1960s to present	None ^c
69	Coal Canyon	Oil and gas (one unitized field)	1960s to present	None ^c
70	Spruce Canyon	Oil and gas (two unitized fields)	1960s to present	None ^c
71	Flume Canyon	Oil and gas (one unitized field)	1960s to present	139.2 million cubic-feet of gas ^c
73	Winter Ridge	Oil and gas	1983 to 1988	1,650 million cubic feet of gas

Source: WSA Analyses

^aActivity intermittent and sporadic throughout period.

^bFigures are for total mining districts, of which WSA is only a portion.

^cWells in WSA are shut in or production is in an unitized field with well adjacent to WSA.

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Table 43
Mineral and Energy Reserve Estimates for the U. S. and Utah

Resource	Reserve	
	U.S.	State of Utah
Oil (million barrels-proven)	26,889	172
Gas (billion cubic feet-proven)	187,211	1,947
Coal (million short-tons demonstrated reserve)	475,945	6,254
Phosphate Rock (million tons)	5,200,000	N/A ^a
Potash (thousand metric tons - K ₂ O equivalent)	360,000	N/A
Tar Sand (billion barrels, oil)	25	25
Oil Shale (billion barrels, oil)	3,008	320
Geothermal	N/A	N/A
Hydropower (megawatts)	62,770	224.7
Uranium (million pounds U ₃ O ₈)	2,850	N/A
Vanadium	N/A	N/A
Copper (thousand metric tons)	90,000	W ^b
Gold (million troy tons)	100	W
Silver (million troy tons)	1,800	W
Lead (thousand metric tons)	27,000	W
Zinc (thousand metric tons)	53,000	N/A
Manganese	N/A	N/A
Beryllium (metric tons)	1,177,000	1,177,000
Tungsten (metric tons)	210,000	N/A
Mercury (flasks)	120,000	N/A
Aragonite-onyx	N/A	N/A
Barite (thousand short tons)	55,000	N/A
Molybdenum (thousand pounds)	11,800,000	N/A

Source: USDI, USGS 1988; USDOE, 1988.

^aN/A = Not Available.

^bWithheld to avoid disclosure of propriety information.

Changes in economic or technologic factors may affect the economic uncertainty of marginal reserves.

To reflect varying degrees of geologic certainty, undiscovered resources may be divided into two categories: hypothetical and speculative. Hypothetical resources reasonably may be expected to exist in the same producing district or region under analogous geologic conditions as similar known mineral bodies.

Speculative resources may occur either in favorable geologic settings where mineral discoveries have not been made or in types of deposits as yet unrecognized for their economic potential (USDI, USGS, 1980). Table 44 lists the total estimated in-place resource including hypothetical/ speculative mineral resources projected to occur in Utah WSAs. The numbers presented in this table are substantially higher than discussed for proven reserves. Also, resource quantity is the commodity rating given by SAI (1982) as amended by the BLM geologist team (USDI, BLM, 1987b); because adjacent WSAs overlap with mineral-producing areas, the accumulative resource quantities are, therefore, overestimated. A total of 47 WSAs are predicted to have a moderate to high cer-

tainty of occurrence for one or more energy and/or mineral resources (see Table 45). Mineral occurrence does not consider economic feasibility of extraction.

Table 44
Total Estimated Mineral and Energy Resources in WSAs
(Including Hypothetical/Speculative Resources)^a

Mineral	Resource Quantity
Oil	1,610 million barrels
Gas	9,860 billion cubic feet
Coal	5.1 billion short tons
Tar Sand	2,693 million barrels
Oil Shale	202.5 million barrels
Potash	67 million metric tons
Phosphate	220 million metric tons
Geothermal	undetermined
Hydropower	310 megawatts
Uranium/Vanadium	undetermined
Copper	2,300,000 metric tons
Gold	4,540,000 troy ounces
Silver	44,900,000 troy ounces
Lead/Zinc	2,400,000 metric tons
Manganese	580,000 metric tons
Beryllium	80 metric tons
Tungsten	4,500 tons
Aragonite-onyx	undetermined
Barite	undetermined
Mercury	undetermined
Molybdenum	undetermined
Titanium	3,001,000 metric tons

Source: SAI, 1982; and WSA Analyses.

^aThe figures presented in this table are, in many cases, substantially higher than those shown for proven reserves for the entire State. It should be noted that this table includes any possible resource that may be present based on geologic conditions and does not account for overlap of any WSAs with the same mineral producing areas.

Strategic and Critical Minerals

The Strategic and Critical Materials Stock Piling Act (Federal Emergency Management Agency, 1988) provides that strategic and critical materials be stockpiled in the interest of national defense to preclude a costly and dangerous dependence on foreign supply sources in times of national emergency. The key elements of the stockpile policy for strategic and critical minerals are: (1) that the stockpile should be sufficient to meet the military, industrial, and essential civilian needs for the first 3 years of a war; (2) that the war scenario shall be consistent with the scenarios being developed by the Emergency Mobilization Preparedness Board; and (3) that goals reflect detailed assumptions regarding changes in a wartime civil economy, foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and alternate foreign and domestic production levels for stockpile materials.

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Table 45
WSAs with Moderate to High
Certainty of Mineral and/or Energy Occurrence

Map Reference Number or Letter	WSA Name	Resource
1	North Stansbury Mountains	Lead/zinc
2	Cedar Mountains	Phosphate
3	Deep Creek Mountains	Gold, silver, copper, tungsten, lead
4	Fish Springs	Lead
5	Rockwell	Tungsten
6	Swasey Mountain	Gold
9	Notch Peak	Tungsten
17	North Fork Virgin River	Coal
19	Parunuweap Canyon	Coal
22	The Blues	Coal
23	Mud Springs Canyon	Coal
25	The Cockscomb	Coal
26	Wahweap	Coal
27	Burning Hills	Coal
28	Death Ridge	Coal
29	Phipps-Death Hollow	Carbon dioxide gas
31	North Escalante Canyons/The Gulch	Tar sand
32	Carcass Canyon	Coal, titanium
35	Fifty Mile Mountain	Coal
36	Mt. Ellen-Blue Hills	Coal
37	Bull Mountain	Coal
38	Dirty Cevil	Tar sand, uranium
39	Horseshoe Canyon (South)	Oil and gas
40	French Spring-Happy Canyon	Tar Sand, uranium
41	Fiddler Butte	Tar sand, uranium
42	Mt. Pennell	Coal, gold, silver, copper
43	Mt. Hillers	Uranium, gold, copper
44	Little Rockies	Uranium, silver, copper
53	Bridger Jack Mesa	Uranium/Vanadium
54	Indian Creek	Potash
55	Behind the Rocks	Oil, gas, potash
56	Mill Creek Canyon	Potash
57	Negro Bill Canyon	Potash
58	Horseshoe Canyon (North)	Uranium/Vanadium, potash
60	Crack Canyon	Uranium/Vanadium, tar sand
61	Muddy Creek	Uranium/Vanadium, tar sand
62	Devil's Canyon	Tar sand
63	Slds Mountain	Uranium/Vanadium, tar sand
64	Mexican Mountain	Uranium/Vanadium, tar sand
65	Jack Canyon	Oil and gas, tar sand, oil shale
66	Desolation Canyon	Oil and gas, tar sand, oil shale, coal, hydropower
67	Turtle Canyon	Oil and gas, coal
68	Floy Canyon	Oil and gas, oil shale, coal
69	Coal Canyon	Oil and gas, oil shale, coal
70	Spruce Canyon	Oil and gas, oil shale, coal
71	Flume Canyon	Oil and gas, oil shale, coal, tar sand
73	Winter Ridge	Oil and gas, tar sand
H	Lost Spring Canyon	Potash

Source: WSA Analyses.

Within Utah, several minerals are included in the National Defense Stockpile Inventory of Strategic and Critical Materials (USDoD, 1988). These minerals

include beryllium (projected to occur in 9 WSAs), lead (10 WSAs), manganese (12 WSAs), silver (13 WSAs), and vanadium (18 WSAs) tungsten (8 WSAs), zinc (10 WSAs), titanium (4 WSAs), molybdenum (3 WSAs), mercury (1 WSA), platinum (1 WSA), cobalt (1 WSA), and nickel (1 WSA). Although listed as strategic, copper is relatively common and supplies currently exceed domestic demand. Copper is projected to occur in 29 WSAs (see Appendix 6, Table 6.1).

Leasable Minerals

• Oil and Gas

The U.S. is a major importer of crude oil. In 1988, import reliance on crude oil constituted about 40 percent of consumption. In 1988, the U.S. produced an average of 8,879 thousand barrels of crude oil per day. Utah produced 33,076,030 barrels of crude oil in 1988. None of this production came from WSAs. The projected amount of oil in Utah BLM WSAs (total estimated in-place resource) is less than four-tenths of 1 percent of the projected U.S. proven and indicated reserves and 12 percent of the estimated Utah proven and indicated reserves.

Domestic production of natural gas in 1988 was about 15.789 trillion cubic feet according to U.S. Department of Energy statistics. The U.S. was a net importer of natural gas, with imports totaling 0.9 trillion cubic feet. Domestic gas production has substantially decreased during the 1980s. In 1988, Utah had 62.3 billion cubic feet of natural gas production compared to 94.2 billion cubic feet in 1982. Of that amount, less than 6 percent was produced in BLM WSAs (Desolation Canyon, Jack Canyon, and Winter Ridge). The projected amount of in-place natural gas in Utah BLM WSAs represents up to 2.7 percent of the estimated national proven reserve. This is an overestimation because the amount of natural gas estimated in WSAs represents hypothetical and speculative amounts and this has been compared to proven reserves.

In 1989, about 264,902 acres within Utah WSAs were under lease for oil and gas. New oil and gas leases have not been issued in WSAs since December 1982.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and generally are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

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Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development. Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydro-mulching (USDI, BLM, 1981b). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA leases.

Leases that are producing oil or gas prior to their original expiration date or that are part of a unitized field would continue. An oil and gas unitized field is formed from leases grouped together in a block for the purposes of exploration and/or production.

Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Table 46 summarizes the 1989 oil and gas leasing status for WSAs. Lease holders and leases not under production or held by established production are constantly subject to change (sold, expired, relinquished, etc.). As a result of the absence of new leasing, normal expiration of nonproducing leases, changed interest in new exploration, and other factors, the amount of leased acreage in WSAs has reduced substantially over the past few years.

Table 46
1989 Oil and Gas Leasing Status for WSAs

Type of Lease	Approximate WSA Acres	Percentage of WSA Acreage
Pre-FLPMA	65,479	2
Post-FLPMA	199,423	8
Total	264,902	8

Source: WSA Analyses.

Oil and gas leasing is managed through a land use category system. The four categories used by Utah BLM to determine allowable leasing activities for oil and gas (including tar sand) are based on potential for development, other resource uses, and protection of sensitive resource values. Category 1 opens public lands to leasing with standard stipulations. Category

2 allows leasing with standard and special stipulations to protect sensitive resource values. Category 3 allows leasing with no right of surface occupancy and use of recovery methods that do not disturb the surface. Category 4 closes lands to leasing. Based on existing BLM planning documents, Table 47 summarizes the acreages and percentages of WSAs within each category. Since December 1982, all WSAs have been placed in Category 4 for the duration of the wilderness review process.

Table 47
Oil and Gas Leasing Categories for WSAs

Category	Acres of WSAs	Percent of WSAs
1. Open to Leasing	1,539,451	47
2. Open with Special Stipulations	861,677	27
3. Open with No Surface Occupancy	318,209	10
4. Closed to Leasing	516,497	16
Totals	3,235,834	100

Source: WSA Analyses.

A large carbon dioxide gas deposit with estimated reserves of up to 4 trillion cubic feet has been discovered in southern Utah immediately north of the community of Escalante. If the estimated reserve figures are correct, this would be one of the largest deposits in the U.S. This deposit could potentially contain substantial amounts of gas. The majority of the deposit is located on the Dixie National Forest, but does extend south onto BLM-administered land, the majority of which is the Phipps-Death Hollow ISA. There has been interest in developing the field, and wells have been drilled on National Forest lands that are capable of production. No wells have been drilled in the ISA. A Known Geologic Structure (KGS) of slightly over 80,000 acres was established but has since been eliminated by passage of the Federal Onshore Oil and Gas Leasing Reform Act of 1987. Of the original acreage about 18,720 acres are on BLM-administered lands.

Carbon dioxide is being considered for use in enhanced oil recovery and as a medium to carry coal slurry. Recent technological developments in enhanced oil recovery, whereby depleted oil fields may be rejuvenated through compressed carbon dioxide injection into oil-bearing formations, could open new markets for carbon dioxide (Rocky Mountain Region Report, 1983).

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• Coal

Domestic coal production for 1988 is estimated at 940 million short tons, of which 187.1 million tons came from Federal lands (USDOE, 1989). In Utah, 18.2 million tons were produced in 1988, including 15.36 million tons from Federal lands. Demand for Utah coal is tied to electrical generation in Utah, in the states west to the Pacific Coast, and potentially the Pacific Rim nations. The major disadvantage for Utah coal is that all current production has and likely will continue to come from underground mines, which makes it economically difficult to compete with Montana and Wyoming surface mined coal for markets in the midwest. An exception would be potential surface mining operations in the Henry Mountain coal field in the vicinity of the Mt. Ellen-Blue Hills WSA. A major portion of the field is not projected to be developed in the foreseeable future because of environmental concerns related to adjacent Capital Reef National Park and the presence of a free roaming bison herd. Other surface mineable coal in Utah is located in the Emery and Alton coal fields.

To date, production of coal in Utah mostly has come from the Wasatch Plateau, Book Cliffs, and Emery coal fields in Carbon, Emery, and Sevier Counties. Passage of acid rain and other clean air legislation by Congress could enhance the market for Utah's low sulfur coal.

The Kaiparowits Plateau contains a substantial underground mineable coal resource that will become increasingly valuable as the Emery and Wasatch Plateau coal reserves are depleted. The Kaiparowits Plateau could be a major source of coal for future power generating plants in the southwest. While BLM has projected that coal development will not occur in WSAs on the Kaiparowits Plateau for 30 to 40 years, there are continuing possibilities to develop existing leases in the Burning Hills area. The proposed Smoky Hollow mine site is located outside the Burning Hills and Wahweap WSAs (Andalex, 1989).

There currently is no coal production in Utah from existing WSAs. Historically, a minor but undetermined amount of coal was taken from mines with leases that extended into The Blues WSA. As of November 1987, there are 76,038 acres in seven WSAs leased for coal. The majority of these leases are located on the Kaiparowits Plateau. In addition to the leases, about 22,964 acres of Preference Right Lease Applications (PRLAs) are located in the Death Ridge WSA (see

Table 48). Appendix 6 discusses projections for development of coal in more detail.

Table 48
Coal Leases and PRLAs in WSAs

Map Reference Number	WSA Name	WSA Acres Under Lease	Percent of WSA Under Coal Lease
22	The Blues	70	0.4
26	Wahweap	17,628	13.2
27	Burning Hills	12,650	20.6
28	Death Ridge	19,381	30.9
32	Carcass Canyon	18,494	39.6
35	Fifty Mile Mountain	7,505	5.2
67	Turtle Canyon	310	1.0
Total		76,038	
Preference Right Lease Applications (PRLAs)			
28	Death Ridge	22,964	36.6

Source: BLM File Data, 1988.

• Tar Sand

There presently is no commercial production of bitumen (oil) from tar sand in Utah or the U.S. Production on a research and experimental basis did occur in Utah in the early 1980s but has since ceased. Some interest continues in local use of the resource as asphalt for roads.

Development of the tar sand resource is authorized by the Combined Hydrocarbon Leasing Act. In compliance with the act, BLM began to convert certain oil and gas leases located in Special Tar Sand Areas (STSAs) to combined hydrocarbon leases to allow for tar sand development. Portions of 14 WSAs, totaling 149,132 acres, are located in these STSAs, as shown in Table 49. No oil and gas leases have been converted to combined hydrocarbon leases in any of the WSAs. However, application was made on approximately 47,631 acres of existing oil and gas leases to convert them to combined hydrocarbon leases. If any lease conversions were to occur in a WSA, the new lease would be post-FLPMA, and any development would be required to be nonimpairing to wilderness values. The most favorable resources are located in the P. R. Spring, Sunnyside, and Tar Sand Triangle STSAs.

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Table 49
WSAs Located in Special Tar Sand Areas

Map Reference Number	WSA Name	STSA	WSA Acreage in STSA	Percent of WSA in STSA
31	North Escalante Canyons/The Gulch	Circle Cliffs	10,260	9
38	Dirty Devil	Tar Sand Triangle	20	less than 1
39	Horseshoe Canyon (South)	Tar Sand Triangle	58	less than 1
40	French Spring-Happy Canyon	Tar Sand Triangle	22,480	90
41	Fiddler Butte	Tar Sand Triangle	41,250	56
59	San Rafael Reef	San Rafael	1,920	3
60	Crack Canyon	San Rafael	630	2
62	Devils Canyon	San Rafael	960	10
63	Sids Mountain	San Rafael	2,500	3
64	Mexican Mountain	San Rafael	28,664	48
65	Jack Canyon	Sunnyside	2,000	27
66	Desolation Canyon	Sunnyside	1,640	less than 1
71	Flume Canyon	P.R. Spring	1,450	3
73	Winter Ridge	P.R. Spring	35,300	83
Total			149,132 acres	

Source: USDI, BLM, 1984b.

• Oil Shale

Annual fuel production from oil shale in the U.S. has not exceeded 100,000 barrels. In Utah, peak annual production was 45,000 barrels from one project (Geokinetics) located in the Uinta Basin north of the Winter Ridge WSA. The project has since been abandoned and there currently is no production occurring in Utah.

Oil shale in Utah is associated with the geologic formations of the Uinta Basin. Oil shale beds in the Uinta Basin are estimated to contain 320 billion barrels in zones up to 700 feet thick. Oil shale deposits of potential commercial interest occur in the Mahogany Beds at the base of the Parachute Member (Green River Formation). No oil shale leasing or production from oil shale has occurred in WSAs. Table 50 shows the WSAs with potential for oil shale resources; however, none of these are in the portion of the Uinta Basin with the largest and richest deposits, where development would be most likely to occur.

• Potash

The U. S. Production of potash totaled 1.52 million metric tons of potash equivalent in 1988, which represents a decline from the over 2.2 metric tons produced in 1980. Utah was responsible for the produc-

tion of potash from one mine and two plans by solution mining and from salt lakes and subsurface brines. About 95 percent of the U.S. output was directly used in the fertilizer industry. The reserve base for potash in the U.S. is estimated at 360 million tons. There is no past or present production and no leases for potash within any of the WSAs. A potential potash resource occurs in 14 WSAs. However, due to more favorable locations elsewhere, BLM does not project potash development in any WSAs in the foreseeable future.

Table 50
WSAs With Potential Oil Shale Reserves

Map Reference Number	WSA Name	Maximum Estimated In-Place Resource/Barrels	Percent of WSA in Oil Shale Withdrawal	WSA Acres Within Oil Shale Withdrawal Area
65	Jack Canyon	90,000,000	100	7,500
66	Desolation Canyon	23,500,000	44.4	128,960
67	Turtle Canyon	1,000,000	11	3,717
68	Floy Canyon	1,000,000	1.3	900
69	Coal Canyon	10,000,000	0	0
70	Spruce Canyon	1,250,000	22	4,440
71	Flume Canyon	1,250,000	7.5	3,800
73	Winter Ridge	48,000,000	100	42,462
Totals		Up to 176,000,000		191,779

Source: WSA Analyses.

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• Phosphate

U. S. production of phosphate in 1988 continued to improve from the depressed production level of 1985 (refer to Table 40). The majority of production comes from Florida and North Carolina. Utah, Idaho, and Montana contributed about 11 percent of the total production. Phosphate production in Utah comes from one mine north of Vernal, Utah. Other small deposits are scattered throughout portions of the State. Only one WSA is projected to contain phosphate. The Cedar Mountains WSA contains an estimated in-place resource of about 220 million metric tons (130 million metric tons are potentially recoverable) over about 14,000 acres of the WSA. Sporadic leasing and prospecting have occurred in the past; however, at the present time, there are no leases in the WSA and the deposit is generally not considered commercially productive.

• Geothermal

Energy production from geothermal resources in the U.S. is limited. All geothermal energy so far exploited or known to be economically exploitable consists of heat contained in water and steam trapped in pockets within the upper part of the earth's crust. Pockets of trapped steam or water of sufficient quality and temperature are known to exist in California, Utah, Colorado, Wyoming, Idaho, and Nevada.

A commercial geothermal field has been developed at the Roosevelt Hot Springs unit near Milford, Utah. According to estimates made by Phillips Petroleum Company and the University of Utah, Department of Geology and Geophysical Sciences, this geothermal field might have ultimate capacity of up to 300 megawatts of electric power, although it is currently producing at about 24 megawatts. Another geothermal site in Utah near Cove Fort recently has been producing 4 megawatts. The West Desert has the highest geothermal potential in Utah.

High potentials were not assigned for geothermal resources within WSAs, except for Fish Springs. In most cases, resources present would be deep, low-temperature thermal waters.

In 1982 a total of 5,400 acres in three WSAs (Fish Springs, Swasey Mountain, and Howell Peak) were leased for the geothermal resource. However, as of August 1985, these leases had expired and there now are no geothermal leases in any WSA.

• Hydropower

Production of hydroelectrical energy in the U. S. was about 308,800 gigawatts in 1988. About 1,391 gigawatts (0.4 percent of national production) are produced in Utah. None of the Utah production occurs within WSAs.

As noted in the Water Resources section, many of the WSAs have limited water resources and, consequently, do not offer hydroelectric development potential. Although 10 WSAs have hydropower potential, only four (Parunuweap Canyon, Horseshoe Canyon [North], Dirty Devil, and Desolation Canyon) have received serious interest. Due to the presence of favorable locations elsewhere, potential environmental constraints, and other factors, BLM does not project hydropower development in WSAs in the foreseeable future.

Locatable Minerals

Utah is an important producer of gold, silver, copper, lead, and zinc; the annual production rates of these commodities from 1984 to 1988 are given in Table 40. Utah's metallic mineral industry has varied with national economic conditions and is generally dependent on the ore production rate from the Bingham Canyon Pit located on private land in Salt Lake County. Precious metal production in Utah has recovered in the last 2 years with the Bingham Canyon Pit re-opening. Production of lead and zinc continues at low levels. Uranium production also has declined. Overall, the mining industry in Utah was at a low level during the early part of this decade, but has been on the rebound since 1986 for some minerals.

There are about 320,470 mining claims on BLM-administered lands in Utah (USDI, BLM, 1988d). Many of these were located for speculation and exploration, with only a small percentage involved in actual production of locatable minerals. Within WSAs, there are about 5,527 mining claims covering about 110,540 acres. The regional distribution of claims is shown in Table 51. As noted on Table 42, production of locatable minerals has occurred in only nine WSAs. The status and potential for specific locatable minerals are further addressed as follows.

• Uranium/Vanadium

Uranium is a silvery-white radioactive metal that, in the form of uranium dioxide (UO_2), is used as fuel for nuclear reactors. Uranium is also used in the

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production of various radioactive isotopes for medical and other applications and for scientific research. One lb of natural uranium can produce as much energy as about 14,000 lb of coal (USDOE, 1987).

Table 51
Mining Claims Within WSAs

Regional	Approximate	Approximate	P e r c e n t
Region	Number of Claims-1988	Acres With Claims	WSA Acreage With Claims
West Central	965 19,300	4.1	
South-West ^a	624 12,480	1.2	
South-Central ^a	1,288 25,760	6.0	
South-East ^b	873 17,460	4.0	
East-Central ^c	1,777 35,540	4.0	
Totals	5,527 110,540	19.3	

Source: WSA Analyses.

^a69 percent of claims and 70 percent of acreage in this region are in Fifty Mile Mountain WSA.

^b83 percent of claims and 72 percent of acreage in this region are in Mancos Mesa WSA.

^c93 percent of claims and 87 percent of acreage in this region are in the six WSAs in the San Rafael area.

The principal States in which uranium ores have been mined (including solution mining) are Arizona, Colorado, New Mexico, Texas, Utah, Washington, and Wyoming. Nebraska is expected to become a uranium-producing State in the near future (USDOE, 1987). Uranium is extracted from uranium ore by chemical leaching to obtain uranium concentrate, with the uranium content expressed as percent U_3O_8 .

Since 1980, there has been a steady decline in the production of uranium. Uranium concentrate production was 13 million lb in 1987, a decrease of about 4 percent from the 1986 production level and substantially down from the 44 million lb of concentrate produced in 1980.

The Colorado Plateau (Colorado, Utah, Arizona) contains approximately 300 million lb of U_3O_8 of reasonably assured resources (RAR). This figure is subject to periodic re-evaluation and may substantially change in the future. Potential for uranium occurs in 69 WSAs, primarily in the South-West, South-Central, and South-East Regions. The majority of this resource is expected to occur in 11 WSAs which have a medium to high potential for uranium resource occurrence (see Table 45). The amount of RAR in the WSAs is difficult to determine but is not expected to exceed 10 percent of the Statewide total. Therefore,

the projected amounts of uranium resource located within the WSAs would not be significant on a State-wide basis.

• Copper

In 1980, the Nation's total copper production was 1.181 million metric tons. Utah production in 1980 was 157,775 metric tons and ranked second to Arizona in the national production of copper. In 1988, nationwide production was 1.44 million tons. Utah production in 1988 was 204.3 thousand metric-tons of copper. About 13 percent of the Nation's copper consumption in 1988 was supplied by foreign imports (USDI, USBM, 1989). Copper consumed in the U.S. is 43 percent building construction, 24 percent electrical and electronics, 13 percent industrial machinery, 10 percent transportation, and 10 percent general consumer products. The Nation's reserve base of copper from mine production is estimated at 90 million metric-tons of copper content.

Copper production in Utah fell from 211 thousand metric-tons in 1981 to 204.3 thousand metric tons in 1988. Medium to high potential for copper reserves is predicted to occur in only three WSAs, although copper resources are found in 29 WSAs.

• Gold

In 1988, the national domestic mine production was 6.6 million troy ounces of gold content. Nearly 20 percent of domestic gold was recovered as a by-product of processing base metals, chiefly copper. In 1986, an estimated 48 percent of domestic use was in jewelry and arts, industrial use was 35 percent, and dental use was 16 percent. The Nation's gold reserve base is estimated at 120 million troy oz.

In 1988, Utah produced 406,000 troy oz of gold. Gold production, largely a by-product of copper, has recovered to near 1981 levels.

Nevada has become the major producing State in the U.S., providing about 50 percent of the U.S. production. New technologies of heap leaching of low grade disseminated gold has enabled the processing of previously uneconomic deposits with average grades of less than 1 gram per metric ton. Nevada mines have enabled the U.S. to become the lowest-cost operators in the world. Similar geologic conditions to those found in Nevada may occur in areas of western Utah. Potential for gold deposits is believed to occur in 10 WSAs, four of which have a medium to high potential

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for occurrence. Three have produced gold in the past (refer to Table 42).

- Silver

Domestic 1988 mine production was estimated at 45 million troy oz. Utah produced 4.32 million troy oz in 1988 or approximately 10 percent of the domestic production. Silver consumption was predominantly for photography and electrical and electronic products. The Nation's reserve base is estimated at 2,300 million troy oz of silver content. Silver is estimated to occur in 13 WSAs, although the potential for future discovery of reserves is rated medium to high in only one WSA. Historically, three WSAs have produced up to 900,000 troy ounces of this metal. The majority of this production has come from the Deep Creek Mountains WSA.

- Lead

Domestic 1988 mine production is estimated at 390 thousand metric-tons, which is down from the 550 thousand metric-tons produced in 1980. Foreign import of lead was 20 percent of consumption in 1986. The reserve base for lead in the U.S. is estimated at 26 million metric-tons of lead. Utah mines yielded 1,662 metric-tons of lead in 1981 (more recent data not available). Lead is projected to occur in 10 WSAs, and lead production has historically occurred in two WSAs. A medium-to-high potential for lead reserves exists in two WSAs (North Stansbury Mountains and Fish Springs).

- Zinc

The Nation's total production was 265 thousand metric-tons in 1988. Twenty-five leading mines primarily from Tennessee and Missouri accounted for 99 percent of mine output. Utah produced 1,576 metric-tons of zinc in 1981 (more recent data not available). Foreign imports were 70 percent of consumption in 1988. Construction materials accounted for 45 percent of the consumption, while machinery and electrical parts accounted for 32 percent. The Nation's reserve base for zinc is estimated at 53,000 thousand metric-tons. The potential for zinc reserves occurs in the same WSAs noted for lead, since these two minerals are often found in combination.

- Manganese

Manganese ore containing 35 percent or more manganese has not been domestically produced since 1982.

Imports for manganese consumption totaled 1,035 thousand short tons in 1988. Most of the available ore was used in producing pig iron, dry cell batteries, and for various chemical purposes. No reserve base for manganese is estimated for the Nation. None of the WSAs is rated medium or high for manganese potential, although 12 WSAs may have some low potential for manganese.

- Beryllium

Domestic beryllium mineral production for 1988 was approximately 280 short tons, although exact figures are not known due to proprietary data. Foreign beryllium imports for 1988 totaled 50 short tons, which is 13 percent of consumption. One company in Utah mined bertrandite (outside of WSAs) and converted both bertrandite and beryl to beryllium hydroxide in Utah. Beryllium is used as a metal in nuclear reactors and aerospace applications and as an oxide in electrical equipment and electronic components. Low potential for the beryllium resource may occur in nine WSAs.

- Tungsten

In 1988, the U.S. mine production was 230 metric-tons from one mine in California. In 1988, 75 percent of consumption was imported. Uses of tungsten include metal working and construction, transportation, lamp and lighting, and electrical. The Nation's reserve base is estimated at 290,000 metric-tons of tungsten content. Historically, tungsten has been produced in one WSA (Notch Peak); this is the only WSA rated with a medium to high potential for additional reserves. A total of eight WSAs are estimated to contain small deposits of tungsten.

- Titanium

Large deposits of titanium ore are not known in Utah. However, sedimentary deposits of titanium-bearing black sandstones do occur as shoreline deposits in the Straight Cliffs and Mancos Shale Formations in south-central Utah. These deposits are believed to contain only small tonnages of titanium. Such deposits are known to occur in the Burning Hills, Death Ridge, Carcass Canyon, and Fifty Mile Mountain WSAs. Because these are believed to be small deposits and the technology for recovery is unproven, it is doubtful that the titanium sands in the WSAs will be developed in the foreseeable future.

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• Other Locatable Minerals

Four other locatable minerals are projected to occur in limited amounts in two WSAs. Mercury, barite, and molybdenum could occur in the Deep Creek Mountains WSA. Mercury has been recovered in the past from this WSA; however, there is no current production. The possibility exists for future development. The actual size of the deposit is not known but is expected to be small. There are no known occurrences of barite in this WSA; however, the geologic environment is promising for the presence of small deposits. Molybdenum is known to occur in the WSA, but deposits are believed small, and no production has occurred.

A small known deposit of aragonite-onyx is located in the Cedar Mountains WSA. The size of the deposit is unknown, but is expected to be smaller and less favorable than surrounding deposits located outside of the WSA. No production has taken place inside the WSA, although two claims for aragonite-onyx are on file.

Salable Materials

Nearly all of the WSAs contain salable materials, usually sand and gravel. Other WSAs contain deposits of limestone, pumice, cinders, quartzite, silica sands, etc. (see individual WSA analyses for details). None of these materials have been taken from WSAs in the past. There is no present demand for these resources from the WSAs and no demand is anticipated in the foreseeable future due to the presence of abundant resources in other, more accessible locations outside of the WSAs.

WILDLIFE INCLUDING SPECIAL STATUS SPECIES

A wide variety of wildlife utilize the diverse habitats of the 83 WSAs. Springs, intermittent streams, riparian vegetation, desert, vegetation transition zones, and rugged terrain (including cliff and talus habitat) contribute to wildlife diversity. Table 52 shows the acreages of various range types (e.g., crucial year-round deer range, high priority summer deer range, and limited value deer range) found in Utah and the WSAs, and provide a Statewide percentage of habitats occurring in WSAs.

The major components of wildlife habitat are food, water, cover, and living space. Crucial wildlife habitat is defined as that portion of wildlife habitat essential to the survival and perpetuation of a certain species in the area (e.g., deer winter range and bighorn

sheep rutting and lambing areas). High priority habitats are intensive use areas. Substantial value and limited value habitats are those areas where wildlife occur or where occasional use occurs.

Table 52
Summary of Wildlife Ranges for Selected Species

Range	Acre Within WSAs	Acre Statewide	Percent of Statewide Range With- in WSAs
Deer	448,140	27,108,900	1.6
Elk	332,955	14,881,700	2.2
Antelope	77,967	8,703,500	1.0
Bison	70,870	150,200	47.2
Rocky Mountain Bighorn Sheep	285,341	N/A ^a	N/A ^a
Desert Bighorn Sheep	556,315	2,279,600	24.4
Riparian	23,775	1,749,600	1.0
Sport Fisheries (miles)	311.5	6,187	3.3

Source: WSA Analyses.

^aNot available.

Only the more common or distinctive wildlife species are included in this section, along with major species of interest that could be affected by wilderness designation.

Terrestrial Animals

• Big Game Species

The WSAs in Utah support six important big game species: mule deer, Rocky Mountain bighorn sheep, desert bighorn sheep, pronghorn antelope, elk, and bison. Table 53 indicates the total WSAs each species inhabits and provides acreage figures for habitat types within WSAs. Mule deer, pronghorn antelope, and bison are generally tolerant of disturbance while Rocky Mountain bighorn sheep, desert bighorn sheep, and elk are less tolerant of disturbance and thrive under wilderness conditions.

Mule deer are abundant and are found in most WSAs. An important mule deer corridor exists in the Swasey Mountain and Howell Peak WSAs. This critical area extends for 6.5 miles in the Swasey Mountain WSA and 7 miles in the Howell Peak WSA.

Rocky Mountain bighorn sheep are found only in the Deep Creek Mountains WSA and four WSAs on the southern slopes of the Book Cliffs. Desert bighorn sheep are found mainly in the south-central and south-east regions and in the San Rafael Swell. Pronghorn antelope mainly inhabit WSAs in the west-central and south-central regions, while elk are found mainly in

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the Book Cliffs (east-central) and south-west regions. Bison are found only in four WSAs in the Henry Mountains portion of the south-central region.

Table 53
Big Game Animals and Habitat Types Occurring Within WSAs

Species	Number of WSAs Where Present	Habitat Type	Total Acres of Range By Type In WSAs
Mule deer	78	Deer range	
		Crucial year-round range	5,652
		Crucial winter range	279,481
		Crucial summer range	48,677
		Crucial fawning grounds	480
		High priority winter range	37,500
		High priority summer range	3,250
		Limited value mule, deer range	73,100
Pronghorn antelope	13	Antelope range	75,067
Rocky Mountain bighorn sheep	6	High priority yearlong range	2,900
		Sheep range	280,931
		Historical sheep range	48,000
Elk	13	High priority yearlong range	4,410
		Elk range	17,810
		Winter range	310,688
		Crucial year-round	4,457
Desert bighorn sheep	19	Sheep habitat	188,159
		Substantial value yearlong range	95,320
		Crucial yearlong habitat	220,190
		High priority habitat	52,646
Bison	4	Limited value yearlong	18,750
		Crucial yearlong	13,000
		Crucial summer range	27,000
		Crucial winter range	12,120

Source: WSA Analyses.

Transplants of Rocky Mountain bighorn sheep and Rocky Mountain elk have been proposed for the North Stansbury Mountains WSA. In January 1984, the Utah Division of Wildlife Resources (UDWR) reintroduced Rocky Mountain bighorn sheep into its historical range within the Deep Creek Mountains WSA, and presently the herd consists of 22 sheep.

In January 1985, 21 desert bighorn sheep were reintroduced into the Little Rockies WSA, and the UDWR has now proposed to transplant bighorn sheep into the Fiddler Butte WSA (adjacent to the Little Rockies WSA), the Mexican Mountain WSA, and the southwestern portion of the Desolation Canyon WSA. Three livestock grazing allotments in the Desolation Canyon WSA were retired in order to provide forage for transplanted desert bighorn sheep. Potential desert bighorn sheep habitat is present in the Fish Springs WSA.

• Small Game Species

Utah's population of black bear and cougar is limited. For this reason, they are classified by the UDWR as game animals. Like cottontail rabbits, upland game birds, and migratory game birds, bear and cougar require a small game or combination hunting license and, therefore, are considered small game animals. Black bears are found in 12 of the WSAs and cougars are found in 52 WSAs. Cougar populations are particularly high in 12 WSAs surrounding the Zion National Park and in the Deep Creek Mountains WSA in the West Desert. Black bear populations are high in six WSAs on the south slopes of the Book Cliffs.

Upland game birds found in WSAs include blue grouse, ruffed grouse, sage grouse, chukar partridge, ring-necked pheasant, and Gambel's quail. Migratory game birds using WSAs are mourning doves, bandtail pigeons, and waterfowl. The chukar partridge can be found in 39 WSAs. Nine hundred acres of winter habitat and 109,880 acres of yearlong habitat have been identified in the 83 WSAs for this upland game species.

• Furbearers

There are several species of furbearers found in the WSAs. These include beaver; weasel; badger; bobcat; red, gray, and kit foxes, mink; and ring-tailed cat. Furbearers are present in at least 35 WSAs. Animals such as coyotes, muskrats, and raccoon are also found in the WSAs; however, they are not considered furbearers by Utah statute.

• Nongame Species

Table 54 summarizes some of the non-game species occurring in WSAs, as identified in the individual WSA analyses.

• Special Status Terrestrial Species

Special status species are defined as those species listed as threatened or endangered by FWS, species that are proposed for listing as threatened or endangered, Category 1 and 2 candidate species, and otherwise sensitive, rare, or endemic species, including any State listed species (see Appendix 4 for details).

No threatened terrestrial species are known to occur in any of the WSAs. However, the threatened Utah prairie dog and Desert Tortoise may be found in a

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Table 54
Typical Non-game Species Present In WSAs

Mammals	
Assorted bats	Porcupine
Blacktail jackrabbits	Rock squirrel
Chipmunks	Spotted skunk
Coyote	Striped skunk
Deer mouse	Assorted voles
Feral goat	Western pipistrel
Assorted mice	White-tail antelope squirrel
Ord kangaroo rat	White-throat woodrat
Plka	Cottontail rabbit
Pinyon mouse	

Birds

American kestrel	Lark sparrow
Ash-throated flycatcher	Magpie
Belted kingfisher	Marsh hawk
Black-throated gray warbler	Huthatch
Black-throated sparrow	Pinyon jay
Bluejay	Plain titmouse
Broadtailed hummingbird	Prairie falcon
Bushtit	Red-tailed hawk
Canyon Wren	Robin
Chipping sparrow	Rock dove
Chickadees	Rock wren
Cooper's hawk	Rough-legged hawk
Downy woodpecker	Rufus-sided towhee
Flicker	Scrub jay
Flycatcher	Sharp-shinned hawk
Gnatcatcher	Swallow
Goshawk	Swift
Great blue herons	Violet-green swallow
Great horned owl	White-crowned sparrow
Hairy woodpecker	Western kingbird
Junco	White-throated swift
Killdeer	Yellow-rumped warbler
King bird	Yellow warbler
Kinglet	

Reptiles

Black-necked garter snake	Western terrestrial garter snake
Collared lizard	Northern whiptail lizard
Great Basin gopher snake	Side-blotched lizard
Hopi rattlesnake	Desert-spiny lizard
Leopard lizard	Desert horned lizard
Midget faded rattlesnake	Bullfrog
Northern plateau lizard	Canyon treefrog
Northern sagebrush lizard	Great Basin spadefoot toad
Northern tree lizard	Great Plains toad
Orange-headed spiny lizard	Leopard frog
Sagebrush lizard	Red-spotted toad
Short-horned lizard	Rocky Mountain toad
Smooth green snake	Utah tiger salamander
Striped whipsnake	Western spadefoot toad
Western fence lizard	Woodhouse's toad
Western rattlesnake	

Source: WSA Analyses

limited number of WSAs. Two endangered bird species, the bald eagle and the peregrine falcon, inhabit or occasionally use at least 53 of the WSAs. The bald eagle is considered to be a migrant in these areas. The endangered black-footed ferret may inhabit some

of the WSAs, however, additional studies are necessary before its presence can be confirmed.

Table 55 identifies those special status species that have not been listed or proposed for listing that occur in Utah WSAs and the number of WSAs in which they occur. Statewide, there are 56 such species of terrestrial wildlife. Of this number, 31 species occur or likely occur in the WSAs. An additional six species identified as Native Utah Wildlife Species of Special Concern by the UDWR are also listed in Table 55.

Table 55
Terrestrial Special Status Wildlife Species In WSAs*

Common Name	Potentially Present - Number of WSAs
<u>FWS Candidate Species</u>	
Ferruginous hawk	81
Spotted bat	2
Great Basin Silverspot butterfly	52
Tanner's black camel cricket	10
Mount Ellen chipmunk	4
Southwestern otter	4
Virgin River montane vole	9
Bonneville pocket gopher	1
Mount Ellen pocket gopher	4
Salt Gulch pocket gopher	3
Skull Valley pocket gopher	2
Swasey Spring pocket gopher	2
Western snowy plover	40
Long-billed curlew	66
Southern spotted owl	54
Mountain plover	16
Merriam's Kangaroo rat	15
White-faced ibis	69
Desert tortoise	2
Coral Pink San Dunes Tiger Beetles	1

BLM and State of Utah Sensitive Species

Arizona Bell's vireo	4
Fox sparrow	1
Gila monster	1
Golden eagle	83
Grasshopper sparrow	1
Lewis woodpecker	11
Mountain bluebird	13
Roadrunner	1
Swainson's hawk	49
Western yellow-billed cuckoo	48
Western bluebird	10

Source: WSA Analyses and Appendix 4.

*Does not include listed species or species proposed for listing.

Aquatic Species

Fish

Fisheries were identified in 12 of the 83 WSAs. Fisheries include perennial streams and sections of rivers

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originating within, flowing through, and/or along the edges of WSAs. Overall, 311.5 miles of the estimated 6,187 miles of stream fisheries in Utah are within WSAs. Fisheries habitat is inventoried and classified on a Statewide basis by the UDWR using four criteria: (1) physical inventory, (2) aesthetics, (3) availability, and (4) productivity. Based on the numerical ratings given for each criterion, a class value of I to VI is given, with Class I being the top-quality fishing waters of the State. Class III streams comprise approximately half of the total stream fish habitat in Utah and support the bulk of stream-fishing pressure. Of the 311.5 miles of stream fisheries in the WSAs, 68.5 are Class III, 211.5 are Class IV, and 31.5 are unclassified. Game species in WSAs include rainbow trout, brown trout, bluegill, cutthroat trout, largemouth bass, channel catfish, black bullhead, and yellow bullhead. Nongame fish species include green sunfish, speckled dace, desert sucker, southwest plains killifish, fathead minnow, bluehead sucker, sand shiner, red shiner, mottled sculpin, green sucker, carp, flannel-mouth sucker, Utah chub, and roundtail chub. The roundtail chub is a completely protected species by the UDWR and is found in two of the WSAs. It is still common throughout the Green and Colorado River drainages; however, it is often mistaken for the endangered Colorado squawfish.

• Special Status Aquatic Species

The Colorado squawfish, bony-tailed chub, and humpback chub are listed as endangered species (USDI, FWS, 1989). They occur in the Green River adjacent to the Horseshoe Canyon (North) WSA, that portion of the Green River within the Desolation Canyon WSA, and in the Colorado River within the Westwater Canyon WSA. There is one confirmed spawning location for the Colorado squawfish in the Green River in the Desolation Canyon WSA.

The Bonneville cutthroat trout (found in the Deep Creek Mountains WSA) and the Virgin River spinedace (found in the Cougar Canyon WSA) are Category 2 candidate species. The razorback sucker (found adjacent to the Horseshoe Canyon [North] WSA and within the Desolation Canyon and Westwater WSAs) is a Category 1 candidate species.

Planned Habitat Improvement Projects

Table 56 lists wildlife habitat improvements proposed within WSA boundaries. The projects listed would be in addition to the livestock watering and land treat-

ment projects listed in the Livestock section, many of which would benefit wildlife.

Unique And Limited High-Value Wildlife Habitat

• Riparian Habitat

Riparian habitat is a native environment that supports plants adapted to moist growing conditions along waterways, springs, seeps, ponds, and lakes. Acreage of this important high-valued habitat is relatively small within WSAs, when compared to the overall acreage. The Cockscomb WSA has 540 acres of riparian areas that are utilized for fawning by pronghorn antelope; this has been designated crucial-critical antelope habitat. In many WSAs (e.g., Jack, Flume, Spruce, and Desolation Canyons), mule deer concentrate in riparian areas and canyon bottoms. In the San Rafael Reef and Crack Canyon WSAs, lambing and rutting grounds along water sources are considered critical habitat. Altogether, WSAs contain approximately 23,775 acres of riparian habitat.

Table 56
Proposed Wildlife Habitat Projects

Project	Number
Catchments	17
Stream Improvements	240
Guzzlers	13
Chalnings, reseeding, land treatments, etc.	10,550 (acres)

Source: WSA Analyses.

• Raptor Habitat

Raptor habitat within WSAs includes rugged canyons, vertical rock walls, and high cliffs. Raptor nests are located on sandstone ledges in canyons. There are 458,530 acres of raptor habitat, including crucial yearlong habitat for the golden eagle, a sensitive species found within the 83 WSAs.

FOREST RESOURCES

The harvest of forest products in Utah takes place in the coniferous forest and pinyon-juniper woodland. The coniferous forest produces pulpwood, saw timber, firewood, fence posts, and Christmas trees. The pinyon-juniper woodland produces firewood, fence posts, and Christmas trees.

Approximately 4 million acres of commercial forest lands exist in the State of Utah. Lands capable of

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producing forest products on a commercial basis are primarily managed by the Forest Service (FS) and State of Utah. Additional areas are managed by the State of Utah and private landowners. Only about 4,000 acres of commercial forest lands of Utah are managed by BLM. These lands are located in the northern portion of the State in Rich County and on Wray Mesa east and south of LaSal, Utah. Neither of these areas are located in or near any of the WSAs.

Noncommercial forest resources are found on approximately 192,000 acres in 24 WSAs. Species include Douglas fir, white fir, Utah juniper, pinyon pine, Gambel's oak, Ponderosa pine, Englemann spruce, subalpine fir, and aspen (see Volume I, Vegetation section and individual WSA analyses for details on individual vegetation types). However, the distribution, density, size, growth rate, terrain, and location of these species precludes commercial harvest. For example, in the Book Cliffs region, it takes 50 to 75 years to produce a 1-inch addition to the diameter of the trunk of a Douglas fir. Even if growth rates were favorable, adverse terrain likely would still preclude harvest.

Some 9.3 million acres of pinyon-juniper woodland are located in Utah, of which approximately 1,714,360 acres are located in 77 WSAs. Composition within the woodland varies greatly (see Volume I Vegetation section and individual WSA analyses for a discussion of individual vegetation types). Depending on the area, associated species can include desert shrubs, mountain shrubs, grasses, blackbrush, sagebrush, or Douglas fir. Examples of this diversity include the Cedar Mountains WSA which is primarily juniper, the Parunuweap Canyon WSA which has a substantial pinyon pine component, while the Coal Canyon WSA has Douglas fir interspersed with the pinyon-juniper woodland. Density also varies greatly with canopy cover ranging from less than 10 percent to nearly 90 percent.

To be classified as commercial woodland, a given area must be capable of producing at least 22 cubic feet of wood per acre per year (Utah BLM Manual 5400). Areas with slopes in excess of 40 percent are considered unsuitable for woodland product harvest. Based on available data, approximately 104,800 acres in nine WSAs meet the definition of commercial or productive woodlands. The nine WSAs are the Deep Creek Mountain, Swasey Mountain, Howell Peak, Notch Peak, Wah Wah Mountains, Conger Mountains, Parunuweap Canyon, Death Ridge, and Winter Ridge. Other WSAs also contain substantial woodlands; how-

ever, a determination of commercial or productive status has not been made.

Table 57 lists production of forest products on a Statewide basis for 1988. Annual harvest of woodland products from WSAs is low due to access problems, terrain, closures, lack of suitable products, and the availability of ample resources elsewhere. In 1988, an estimated 600 cords of firewood were gathered from WSAs. In addition, approximately 200 fence posts and an undetermined number of Christmas trees were illegally harvested from the WSAs. No commercial harvest of any woodland products has occurred in the WSAs. Due to the presence of adequate woodland products outside of the WSAs, BLM does not believe that demand for woodland products within WSAs will substantially increase in the foreseeable future, with the possible exception of the Parunuweap Canyon, Carcass Canyon, and Death Ridge WSAs.

Table 57
1988 Statewide Forest Production
from State and Federal Lands

Product	Unit	BLM Lands	Other Lands	Total
Saw Timber	MBF ^a	0	60,456	60,456
Fuelwood	Cords	10,937	152,247	168,184
Christmas Trees	Number	10,760	33,470	44,230
Posts and Poles	Number	31,625	107,295	138,920

Sources: USDA, FS, 1989; UDNRE, DSLF 1989; and USDI, BLM, 1989.

^aOne thousand board feet.

Note: Some figures represent quantities sold but not necessarily harvested. Private land production statistics are not included.

Approximately 568,571 acres of 20 WSAs have been closed to woodland harvest as a result of decisions made in land use plans. Reasons for the closures vary, but include protection of wildlife habitat and watershed values. Many of the acres closed to woodland harvest are located in marginal woodlands such as the Dirty Devil, Horseshoe Canyon (North), and Crack Canyon WSAs.

LIVESTOCK AND WILD HORSES/BURROS

Domestic Livestock

Domestic livestock grazing on Utah's public lands began about 1850. Small numbers of sheep and cattle were owned by pioneer settlers. However, domestic herds increased dramatically and, with the advent of large, transient sheep herds, the range soon became overstocked. Peak numbers of grazing animals

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occurred in the 1940s with approximately 200,000 cattle and 2 million sheep (USDI, BLM, 1975). During 1986 in the State of Utah, there were 660,000 cattle owned by approximately 8,800 livestock operators and 460,000 sheep owned by approximately 2,400 livestock operators. The total estimated annual livestock animal unit months (AUMs) used in Utah that year was 7,920,000.

Currently, BLM-administered lands in Utah are divided into 1,519 allotments for livestock grazing and are being used by 1,762 permittees. Most permittees utilize public land in conjunction with National Forest, private, and State land in order to conduct a year-round operation.

Permittees generally have cow-calf operations. Semi-desert ranges are better suited for producing calves than for putting weight on yearlings. A typical operation used by many of the permittees includes grazing on public and State lands during the winter-spring season (October to May), followed by a move to higher pastures on National Forest lands during the summer months. A few operators use public land for yearlong grazing. Private lands are also used yearlong to restore cattle in poor condition and to fatten calves or yearlings prior to sale. Since winter feed is a critical factor in expanding or maintaining individual livestock operations, the importance of public land in Utah's livestock industry is greater than its proportionate share of AUMs.

Utah's sheep industry has been declining since the 1940s. This is primarily due to market factors, increased sheep herding costs, and predators. Three hundred and forty-one permittees were licensed for sheep use on public lands in 1986. Most of this use occurs during the winter on West Desert ranges.

In total during 1986, 1,767 permittees grazed 153,964 cattle and horses and 456,902 sheep and goats on public lands. Approximately 23 percent of Utah's beef cattle graze on public lands and 99 percent of Utah's sheep graze on public land.

Portions of approximately 22 percent of the BLM grazing allotments are in the BLM WSAs. Altogether, 95,345 AUMs have been allocated for livestock use in the 83 WSAs. These AUMs represent 5 percent of the total AUMs allocated on public land in Utah. In many cases, for those allotments containing areas under wilderness review, the WSA portion of the allotment is unsuitable or marginally suitable for livestock graz-

ing due to rough terrain, relative absence of vegetation, and lack of water in many WSAs.

A total of 339 permittees have grazing permits inside the WSAs. This accounts for about 19 percent of the permittees using public lands in Utah.

Range Projects

Existing and proposed range developments within WSAs are listed in Table 58. Some of these projects generally are designed to benefit not only livestock, but also wildlife and watershed resources. Such projects have historically been maintained by heavy equipment and various types of vehicles. Proposed vegetation treatments are based on estimates that come from existing BLM land use plans, adjusted to reflect current economic, physical, and environmental conditions as explained in Appendix 6. Within WSAs there are approximately 679.3 miles of ways. Many of these ways are being used to maintain the developments listed in Table 58 and to manage livestock. Ways are used to haul water and salt, and they also provide a means for the ranchers to check on their herds. However, those ways were not constructed and maintained sufficiently to be classified as roads during the inventory process.

Table 58
Existing and Proposed Range Developments in WSAs

Improvement	Existing	Proposed
Fence (miles)	165.75	36
Vegetation Treatments (acres)	28,209.00	16,259
Additional AUMS ^a from treatments	---	3,603
Wells (number)	14	6
Springs or Seeps (number)	78	49
Livestock Reservoir (number)	135	54
Pipeline (miles)	28.55	32.20
Water Catchment (number)	---	6
Stock Tanks (number)	2	1

Source: WSA Analyses.

^aIncludes AUMs from livestock (3,408 AUMs on 16,259 acres), wildlife (10,550 acres), and watershed (1,400 acres) treatments.

Predator Control

Predator control is a program associated with domestic livestock grazing (primarily sheep) on public land. Personnel of the Animal and Plant Health Inspection Service (APHIS) carry out the predator control program in Utah with various control measures such as trapping, gunning, and limited use of poison. Areas where such control measures are not used include

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recreation areas where visitor use is high and areas where predation problems are minimal.

During the 1986 to 1987 period, predator control was conducted in grazing allotments that comprise portions of 16 of the 83 BLM WSAs. Predators removed included 523 coyotes, eight foxes, and one bobcat. Seventy-eight percent of the coyotes were taken by means of fixed wing aircraft or cyanide guns (USDA, APHIS, 1988). However, only a portion of the predators were actually taken inside the WSAs. Sheep and lamb losses in the allotments that comprise the WSAs totaled approximately 262 animals. This amount is 0.5 percent of the sheep and lambs lost to predators Statewide (UDA, 1989).

Wild Horses/Burros

About 1,300 wild horses and 85 wild burros use the public lands of Utah. Most of Utah's wild horses are located in isolated mountain ranges of the West Desert. The population increase for wild horses is estimated at 15 to 20 percent annually. Competition with livestock and wildlife is increasing, and some wild horse ranges are showing a downward trend. To alleviate this problem, BLM captures horses and makes them available for adoption in accordance with the Wild Horse and Burro Act of 1971. In 1987, BLM captured 175 horses and arranged adoptions for 126 of them. Horses are presently captured by water trapping (fencing waters with a built-in capture system), roping, chasing with horses and helicopters, and drugs (dart guns).

Twelve WSAs have wild horses and three WSAs have wild burros. Approximately 515 horses and 64 burros are found within WSAs for part of each year. These numbers represent nearly 40 percent of the wild horses and 75 percent of the wild burros in the State. There are no special wild horse/burro management facilities (water traps, holding pens, etc.) found in the WSAs, and none are proposed. Vehicles occasionally are used on ways to view the horses and drive them into traps.

VISUAL RESOURCES

Utah Scenic Landscapes

Utah's visual landscape character has a variety of landform, vegetation, and color. There are three general types of landscapes:

- The western portion of the State is characterized by sparsely vegetated north-south trending mountain ranges isolated between flat desert valleys.
- The north-eastern and north-central portions of the State have a rugged and forested mountainous character.
- The eastern and southern portions of the State are characterized by terraced, forested plateaus and colorful, sparsely vegetated, deeply entrenched canyonlands that display a variety of weathered formations. Also, there are isolated north-south trending mountain ranges.

BLM and FS have visual resource systems to define the scenic quality of the visual resources and define management goals for the visual resources.

Scenic quality is rated as Class A, B, or C. Class A landscapes are rich in variety, distinctive, and have the greatest scenic appeal to most viewers. Class B landscapes are considered moderate in variety, distinction, and viewer appeal, while Class C lands have little variety, distinction, and viewer appeal.

To identify management objectives for visual resources, BLM lands are categorized into four visual resource management (VRM) classes. FS lands are categorized into five visual quality objectives. VRM classifications for both agencies are described in Appendix 7, as are other visual resource terms.

For this analysis, the BLM VRM system is used. The four VRM classes are as follows: Class I allows for natural ecological change only; Class II allows for non-evident manmade changes only; Class III allows for evident manmade changes that do not subordinate the landscape character; and Class IV allows for evident manmade changes that subordinate the landscape character.

Table 59 identifies acres of BLM and FS lands in the State under each VRM class. Other Federal lands in Utah (NPS lands, Department of Defense withdrawal lands, and other withdrawal lands), Indian reservation lands, State lands, other government lands, and private lands have not been analyzed in detail for scenic quality or VRM class ratings. The table gives an estimated general indication of ratings for Federal, State, other government, and private lands, using the BLM VRM system.

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Table 59
Visual Resource Quality and Management Objectives for Utah^a

Lands	Acres	Scenic Quality in Acres			VRM Classes in Acres			
		Class A	Class B	Class C	Class I	Class II	Class III	Class IV
BLM Lands	22,073,611	3,400,663	5,505,454	13,167,494	200,622	3,888,272 ^b	2,958,233 ^b	15,026,484 ^b
FS Lands	8,150,426	2,052,870	5,102,768	994,788	780,088	2,210,562	3,006,167	2,153,609
NPS Lands	1,921,000	1,287,070	633,930	0	1,921,000	0	0	0
Indian Reservation Lands	2,274,000	341,100	568,500	1,364,400	413,000	334,980	260,540	1,265,480
Department of Defense Withdrawal Lands	1,874,000	281,100	468,500	1,124,400	0	0	0	1,874,000
Other Federal Withdrawal Lands	877,000	131,550	219,250	526,200	0	0	0	877,000
State, Other Government, Private Lands	15,371,403	2,305,710	3,842,851	9,222,842	56,800	2,756,629	2,144,044	10,413,930
Totals	52,541,440	9,800,063	16,341,253	26,400,124	3,371,510	9,190,443	8,368,984	31,610,503

Source: BLM File Data.

^aOnly BLM and FS lands have been subject to detailed visual resource system ratings. All other ratings are estimated.

^bA total of 600,000 acres of unclassified lands have been averaged into VRM Class II, Class III, and Class IV acreages.

Visual Resource Quality of WSAs

Ten of twelve WSAs located in the western portion of the State are largely comprised of north-south trending mountain ranges. These include the North Stansbury Mountains, Cedar Mountains, Deep Creek Mountains, Fish Springs, Swasey Mountain, Howell Peak, Conger Mountain, Notch Peak, King Top, and Wah Wah Mountains WSAs. Two other WSAs, Rockwell and Cougar Canyon, also are typical of the valley and mountain foothill areas of this part of Utah. The other 71 WSAs are part of the forested plateaus and/or colorful canyonlands in the eastern or southern portions of the State, or are part of the Henry Mountains.

When combined, the 83 WSAs under review have approximately 1,765,721 acres of A quality scenery, 1,098,355 acres of B quality scenery, and 371,758 acres of C quality scenery (refer to Table 60). This represents approximately 52 percent of all A quality scenery on BLM lands and 18 percent of all A quality scenery in the State of Utah; 20 percent of all B quality scenery on BLM lands and 7 percent of all B quality scenery in the State of Utah; and 3 percent of all C quality scenery on BLM lands and 1.4 percent of all C quality scenery in the State of Utah.

When combined, the 83 WSAs have 178,231 acres of VRM Class I lands; 1,787,522 acres of VRM Class II lands; 360,279 acres of VRM Class III lands; and

909,802 acres of VRM Class IV lands (refer to Table 60). This represents about 89 percent of all VRM Class I lands currently managed by BLM in the State of Utah and 5.2 percent of all VRM Class I type lands in the State; 46 percent of all VRM Class II lands currently managed by BLM in Utah and 19 percent of all VRM Class II type lands in the State; 12 percent of all VRM Class III lands currently managed by BLM and 4.3 percent of all VRM Class III type lands in the State; and 6 percent of all VRM Class IV lands currently managed by BLM and 3 percent of VRM Class IV type lands in the State.

Visual resource management may include protection, project design with aesthetic provisions, or landscape rehabilitation. Visual restoration potential is limited in most of the WSAs because of their arid nature. Ground disturbances return to original condition very slowly due to sparse soils and slow plant growth. In addition, disturbed areas may be visible because of the lack of vegetative or topographic screening.

CULTURAL RESOURCES

Cultural resources are those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features. These resources consist

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Table 60
Visual Resource Values of WSAs

Total WSA Acres	VRM Class in Acres				Scenic Quality in Acres		
	I	II	III	IV	A	B	C
3,235,834	178,231	1,787,522	360,279	909,802	1,765,721	1,098,355	371,758
No. of WSAs ^a	7	66	39	46	69	54	38

Source: WSA Analyses.

^aDoes not total to 83 because more than one class may be present in a WSA.

of: (1) physical remains; (2) areas where significant human events occurred, even though evidence of the event no longer remains; and (3) the environment immediately surrounding the actual resource. Cultural resources, including both prehistoric and historic remains, represent a part of the continuum of events from the earliest evidence of man to the near present. A site is an identifiable area of human activity presumed to be interpretable.

Most of Utah has been occupied by a number of groups with distinct cultures. BLM recognizes the following classes of cultural resource in Utah: (1) Paleo-Indian (12,000 to 7,000 BC), includes the Clovis and Folsom traditions, (2) Archaic, (7,000 BC to 500 AD), (3) Formative (100 to 1,250 AD); includes Fremont and Anasazi cultures; (4) Proto-Historic, historic aboriginal populations (1,200 to 1,850 AD); (5) Historic aboriginal populations (1,200 to 1,850 AD); (6) historic anglo colonization (1,850 to present); and (7) unknown. These classes roughly conform to or parallel traditional classification schemes.

The prehistoric traditions include hunting/gathering, nomadic lifestyles (classes 1, 2, and 4) and sedentary horticultural lifestyles supplemented by hunting/gathering (class 3) (Classes are management groupings that generalize broad, temporarily based types of sites to develop appropriate long-term management strategies.). The numerous factors typical of these lifestyles are complex; however, certain diagnostic features, artifacts, and environmental adaptations characterize each lifestyle.

The Paleo-Indian cultures occupied land throughout North, Central, and South America. Sites have been identified from Alaska to the southern tip of South America. In Utah, sites have been located in the Great Basin, primarily along the shores of ancient Lake Bonneville. Paleo-Indian sites are characterized by large lanceolate projectile points frequently found in late Pleistocene glacial/pluvial conditions. Sites and artifacts associated with these cultures are extremely

rare in Utah. During 1984, a significant Folsom site was found on public land south of Green River, Utah. Important artifacts found at the site included a projectile point and a stone tool kit used to fabricate such points. As the presence of such points suggests, the Paleo-Indian cultures were primarily big game hunters adapted to a late Pleistocene environment.

The Archaic tradition is one directed towards seasonal exploitation of diverse plant and animal life. Sites are prolific and are usually characterized by distinctive projectile points, milling stones, basketry, and specialized artifacts correlated to hunting and gathering (e.g., Danger, Hogup, and Sudden Shelters).

The formative period is materially, socially, and descriptively complex and is characterized by pit and surface architecture, pottery, etc. Sites of this type are often distinguished by the presence of long-term occupational traits (e.g., Mule Canyon Ruins, Median Village, and Snake Rock Village). The Four Corners region is renowned for its wealth of cliff dwellings, structural components, and other remnant values of the Anasazi culture. Left behind by this most advanced prehistoric American Indian culture, such ruins are an obvious and valuable nonrenewable resource.

Proto-historic groups in general followed an Archaic traditional lifestyle, but sites often are distinguished by remaining evidence of simple architecture, late prehistoric projectile points, and occasional ceramics. The Navajo, Ute, and Paiute tribes, living in Utah at the time of the initial Spanish exploration into the area, are representative of the Proto-historic lifestyle.

The historic Anglo colonization influence includes those artifacts and cultural traditions imported into the Southwest from Europe by the Spanish and subsequent groups.

Long-term strategies for management of cultural resources revolve around the following use categories:

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(1) current scientific use; (2) potential scientific use; (3) conservation for future use; (4) management use; (5) sociocultural use; (6) public use; and (7) discharged use.

The 83 WSAs have varying degrees of cultural significance (USDI, BLM, 1988c); however, it is generally recognized that those in the south-east region are the most outstanding (or at least the most well known). There are at least 48,000 recorded cultural resource sites in the State of Utah. About 2,256 of these sites are in BLM WSAs. Eighteen of the WSAs have no recorded sites. Only a small portion (less than 1 percent) of the acreage under wilderness review has been systematically inventoried for the presence of cultural resources^{1/}. A high potential for discovery of additional sites in the future is estimated for 49 WSAs. The WSAs identified in Table 61 are known to contain high potential for cultural resources.

Much of the archaeological and historical record of Utah has disappeared. The destruction of cultural resources is an ongoing process that takes many forms. Substantial loss is caused by natural forces relating primarily to wind and water erosion. Stone masonry walls crumble and eventually collapse. Sites are washed away in floods. Pictographs and petroglyphs slowly disappear from eroding sandstone. Natural soil mixing caused by seasonal freezing and thawing disrupts the original relationships between subsurface artifacts. Excavations at archaeological sites routinely expose the aftermath of the destructive activities of insects and rodents that have burrowed through them. Natural forces are slow and methodical and, on occasion, steps can be taken to minimize or eliminate their effect on cultural resources.

Human events are the other major reason for loss of cultural resources. The harmful effects of man on cultural resources include intentional pothunting or vandalism and inadvertant disturbance.

The source of loss that is difficult to deal with is the intentional vandalism of archaeological and historical remains. It represents a two-fold threat: (1) vandalism threatens more sites than natural causes or development, and (2) vandalism is selective. Whereas sites of all types and varying degrees of relative importance are subject to the forces of nature and development, vandalism targets only those that are signifi-

cant in one way or another. Some forms of vandalism are more harmful than others, but they are all illegal, and they all result in irreparable damage to the cultural resource and to the information that can be obtained. Much vandalism today is motivated by personal gain as evidenced by personal collections and commercial ventures aimed at resale and profit. Malicious acts brought about by frustration with governmental policies also take a toll. Whatever the motive, vandalism is so prevalent that most sites have been disturbed to some degree. Statistically, it has been shown that most collectors and amateur diggers prefer accessible areas, while commercial diggers prefer remote, inaccessible areas (Nickens, et al., 1981).

Table 61
WSAs With High Potential for Cultural Resources

Cedar Mountains	Grand Gulch
Swasey Mountains	Mule Canyon
Cougar Canyon	Butler Wash
Canaan Mountain	Behind the Rocks
Wahweap	Horseshoe Canyon (North)
Steep Creek	Sids Mountain
Mt. Ellen/Blue Hills	Turtle Canyon
Filddler Butte	French Spring/Happy Canyon
Mancos Mesa	North Escalante Canyons/The Gulch
Fish Creek Canyon	North Stansbury Mountains
Dark Canyon	King Top
Indian Creek	Parunuweap
Negro Bill Canyon	Paria-Hackberry
Devil's Canyon	Phipps-Death Hollow
Desolation Canyon	Fifty Mile Mountain
Winter Ridge	Horseshoe Canyon (South)
Daniels Canyon	Little Rockies
Deep Creek Mountains	Road Canyon
Notch Peak	Cheesebox Canyon
Red Mountain	Bridger Jack Mesa
Moquith Mountain	Mill Creek Canyon
Death Ridge	San Rafael Reef
Carcass Canyon	Mexican Mountain
Dirty Devil	Westwater Canyon
Mt. Pennell	

Source: WSA Analyses.

Federal and State governments effectively deal with many potentially destructive activities through protective legislation that requires the avoidance or mitigation of the impacts associated with land alteration and use. Much needless destruction is avoided in this way. These forms of cultural resource loss are commonplace, and dealing with them to minimize their effect has become almost routine.

It has been argued that many important sites would never have been discovered had it not been for the natural forces of erosion, a construction project, or

^{1/} Complete inventories are not essential to the wilderness review process. Cultural resources may be a special (or supplemental) feature, but are not the primary criteria on which wilderness suitability is determined.

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even the activities of collectors and pothunters. This is true to a point, but many more sites are lost due to these forces than are preserved.

Since 1906, a large body of legislation has been passed to prevent the destruction of archaeological sites, whatever the cause. National parks and monuments were created to preserve the significant prehistoric remains at Mesa Verde, Yucca House, and Hovenweep. Even though collecting on Federal land has been illegal since 1906, collecting has continued somewhat unabated up to the recent times, although increased enforcement efforts currently are underway.

RECREATION

Recreation opportunities and uses include a wide variety of resources and activities. In the context of the wilderness study, a distinction is necessary between activities based on motorized or mechanical equipment as compared with those activities which qualify as primitive and unconfined recreation according to the intent of the Wilderness Act.

National Perspective

• General Trends

Outdoor recreation on Federal lands and waters has national, regional, and local aspects. Figure 4 indicates the visitation trends associated with the Federal areas for the nation and for Utah.

Most recreation on the Federal areas is nature oriented and differs from the activities normally found in constructed city parks. Tables 62 and 63 list typical activities occurring on Federal lands and key use characteristics for these types of activities.

Studies indicate that the number of recreation visits is continuing to increase; however, the length of stay at most Federal recreation areas is decreasing. This reflects the broad trend that many Americans are taking shorter trips closer to home and they are taking more of them (Task Force for Outdoor Recreation Resources and Opportunities, 1988). On a national basis, use data indicates generally level or declining visitation to remote recreation areas, but increased visitation to areas near population centers. Nationally, in recent years, the following activities have experienced a rapid growth in popularity: bicycling (particularly mountain bikes), camping, hiking/backpacking, and walking for pleasure (Presidents Commission on American Outdoors, 1986).

The amount of recreation use for each type of activity can be influenced by variables such as population, economic status, urban/rural residence, education, age, availability of sites, fees, etc. For example, Figure 5 illustrates that young people are highly active in both backpacking and developed camping, while older people participate more in developed camping than in backpacking.

Table 62

Annual Population Participation Rates and Frequency of Participation in Selected Public Area Outdoor Recreation Activities

Activities	Population Participating One or More Times Annually (Percent) ^a	Median Frequency of Participation Annually per Participating Person (Number of Days)
Land-based		
Sightseeing	46.9	12
Picnicking	46.2	6
Walking for pleasure	41.3	29
Driving for pleasure	38.4	19
Nature study/photography	36.2	13
Developed camping	34.9	7
Dayhiking	23.8	5
Primitive camping	14.2	5
Other hunting	11.8	9
Backpacking	10.4	4
Big game hunting	9.9	7
Driving ORVs	9.2	10
Horseback riding	8.6	2
Water-based		
Swimming outdoors	50.3	17
Warmwater & saltwater fishing	30.9	10
Motorboating	22.2	7
Coldwater fishing	16.7	7
Waterskiing	12.9	4
Canoing/kayaking	13.9	2
Sailing	7.5	2

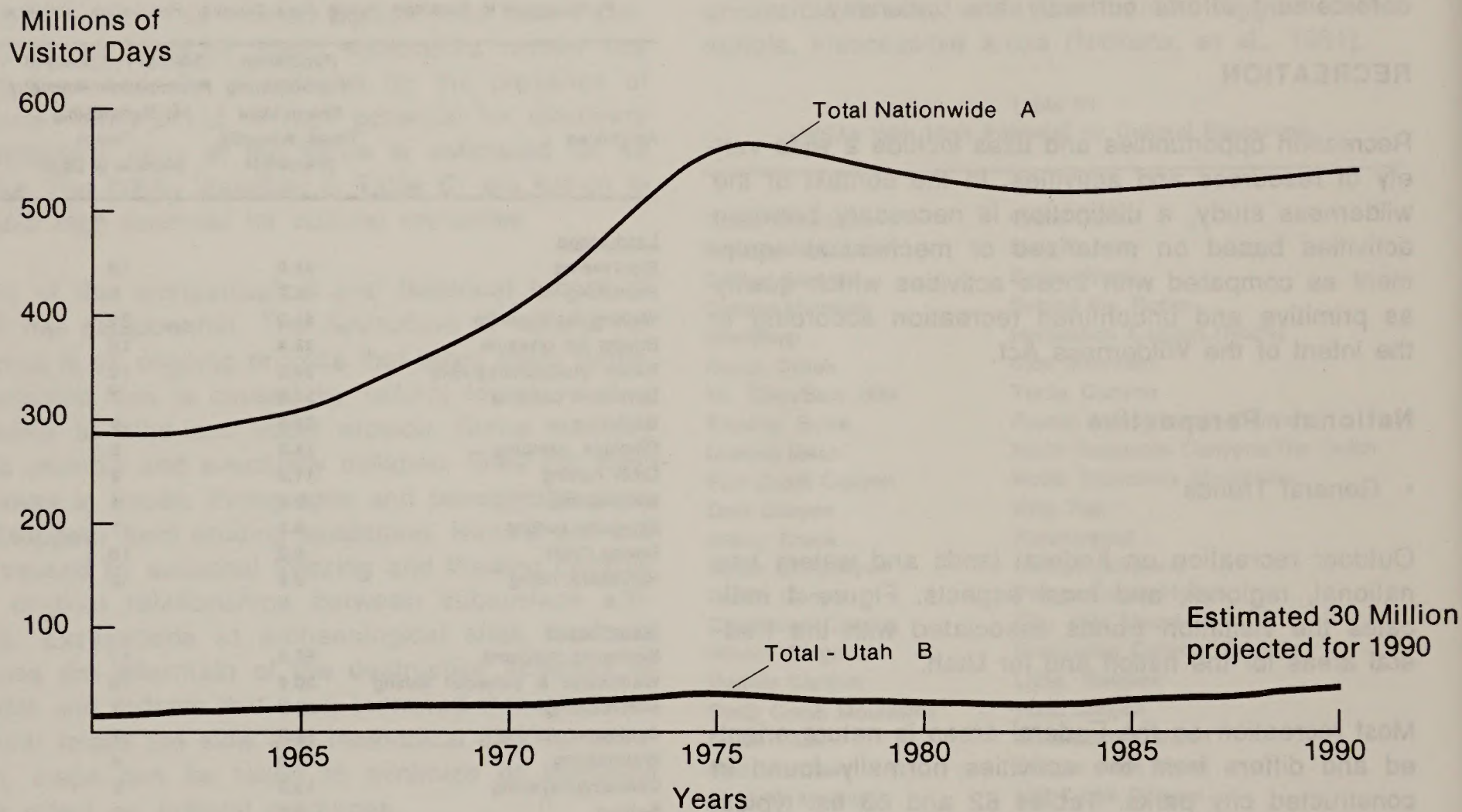
Source: Task Force on Outdoor Recreation and Opportunities, 1988.

^aPercent participation figures represent percent of the American public 12 years old or older who use federal and state recreation areas and participate in the activities listed. Days of participation figures are the median number of days of participation by those individuals in the sample who participate in the selected activity.

In addition to variations in the types of recreation, visitors select locations which offer specific attributes and opportunities. The quality of the experience is a significant factor affecting public satisfaction and repeated use. Tables 64 and 65 rank user values that are reflective of outdoor recreation experiences, based on a national survey.

It has been predicted that the nationwide demand for nonmotorized or wilderness-type recreation, through the year 2000, would grow at a rate slightly greater

RECREATION VISITATION ON FEDERAL AREAS



A — Includes visits to areas administered by BLM, FS, NPS, FWS, Bur Rec, CE, and TVA.

B — Includes visits to areas administered by BLM, FS, NPS. Visits to other Federal areas in Utah are inconsequential.

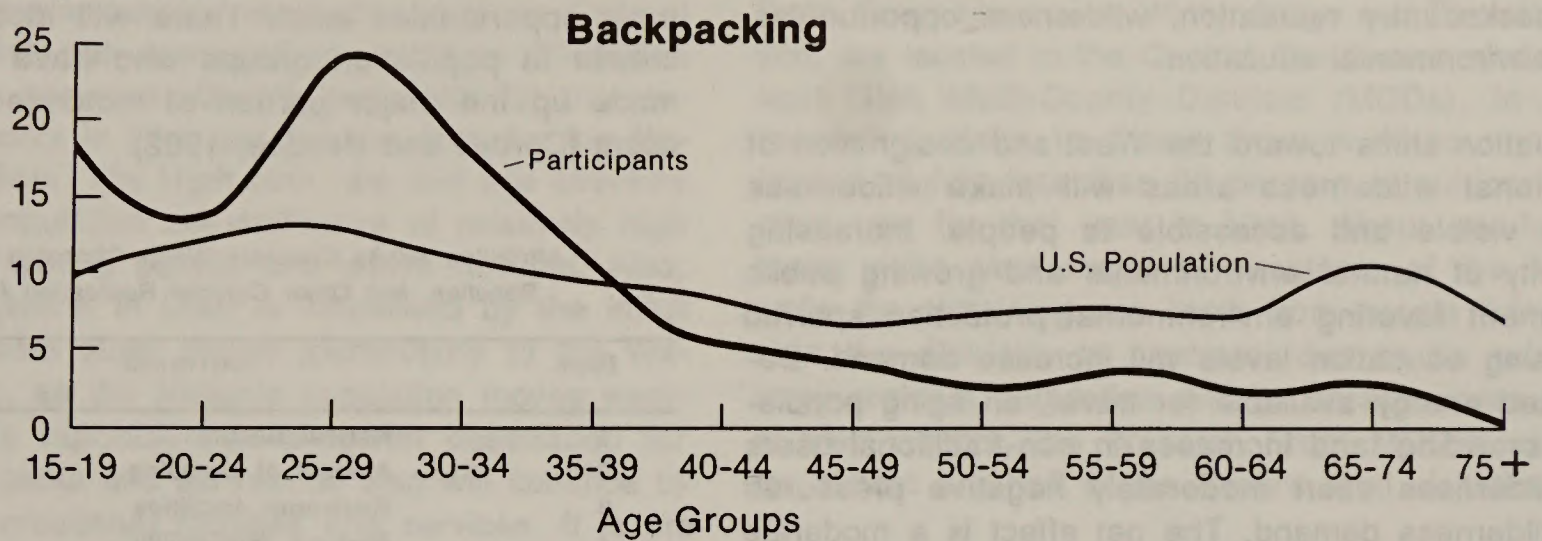
Source: Task Force on Outdoor Recreation and Opportunities

FIGURE 4

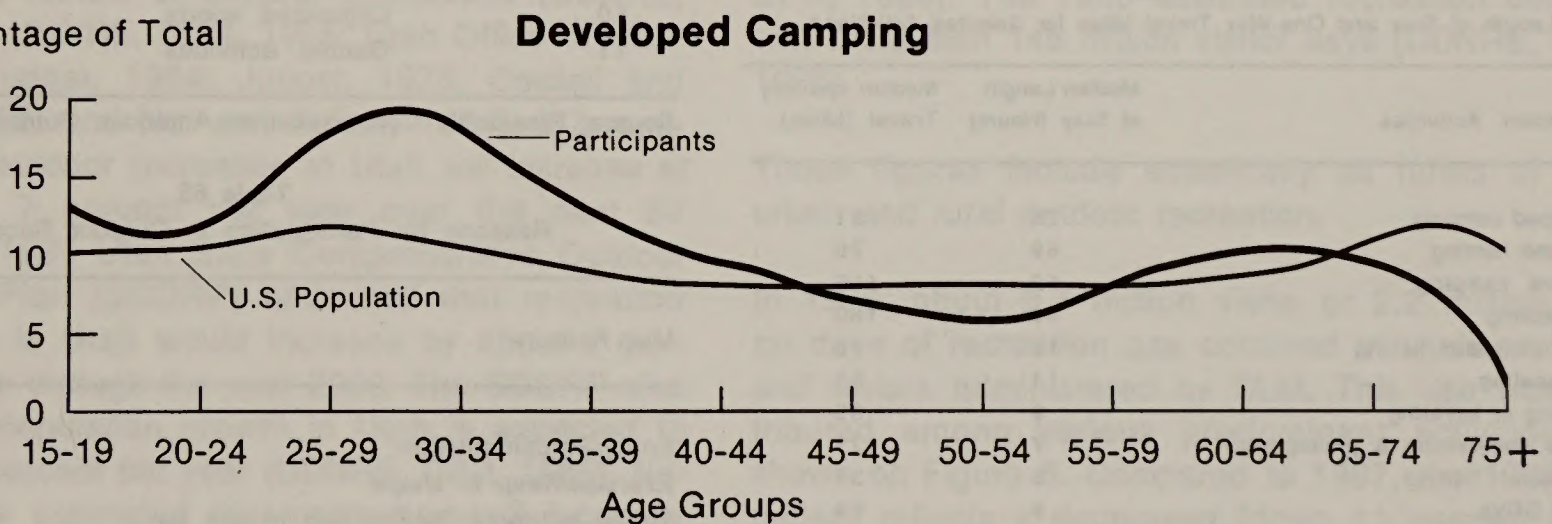
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AGE DIFFERENCES IN PARTICIPATION

Percentage of Total



Percentage of Total



Source: Task Force on Outdoor Recreation and Opportunities

FIGURE 5

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than that of population growth. The following conditions were identified in deriving the predicted demand for nonmotorized recreation. It is expected that Government agencies will place more emphasis on providing backcountry recreation, wilderness opportunities, and environmental education.

Population shifts toward the West and designation of additional wilderness areas will make wilderness more visible and accessible to people. Increasing scarcity of natural environments and growing public sentiment favoring environmental protection spurred by rising education levels will increase demand. Decreased energy available for travel, an aging population, crowding, and increases in non-traditional users of wilderness exert moderately negative pressures on wilderness demand. The net effect is a moderate growth of wilderness demand and potential crowding in those wilderness areas closer to population centers (Cordell and Hendee, 1982).

Table 63
Length of Stay and One-Way Travel Miles for Selected Activities^a

Recreation Activities	Median Length of Stay (Hours)	Median one-way Travel (Miles)
Developed camping	75	81
Big game hunting	69	70
Primitive camping	62	100
Backpacking	49	160
Cold freshwater fishing	12	79
Motorboating	11	53
Canoeing or kayaking	9	85
Wildlife observation & photography	7	171
Warmwater fishing	6	39
Driving ORVs	6	69
Dayhiking	5	56
Outdoor swimming (lakes, streams, etc.)	4	29
Sightseeing	4	30
Small game hunting	4	30
Picnicking	4	30
Walking for pleasure	3	25
Driving for pleasure	2	20

Source: Task Force on Outdoor Recreation and Opportunities, 1988.

^aAll figures represent responses related to the activity selected as the "main" reason for coming to the site. Length of stay was calculated by subtracting the reported arrival time from the departure time, and converting to hours. Both sets of figures are for single destination or primary destination trips only.

Demand for primitive and semiprimitive motorized recreation opportunities is expected to grow at about the same rate or slightly less than the overall rate of population growth. This is based on the following conditions: rapidly increasing energy prices, periodic, severe shortages of gasoline, plus increasingly stringent restrictions on motorized vehicles on forest and range lands will depress demand for motorized recre-

ation. The downward pressures will be moderated by more quiet and fuel-efficient motorized recreation equipment, by population growth, and by the redistribution of population toward the South and West where most opportunities exist. There will also be an increase in population groups who have traditionally made up the major portion of motorized recreation users (Cordell and Hendee, 1982).

Table 64
Attributes Adults Consider When Choosing Parks, Beaches, and Other Outdoor Recreation Areas

Rank	Attribute
1	Natural Beauty
2	Amount of crowding
3	Restroom facilities
4	Parking availability
5	Available information
6	Picnic areas
7	Cultural events
8	Fees charged
9	Concessions
10	Organized sports
11	Guided activities

Source: Presidents Commission on American Outdoors, 1986

Table 65
Reasons for Participating in Outdoor Recreation

Main Reasons ^a	Percent of Sample
Enjoy/Enjoyment/Fun	36
Exercise/Keep in shape	25
To be outdoors/Outside/Just to get out	22
Health/Healthier/For the health/Feel good	15
Fresh air	12
Be with people/Friends/Camaraderie/Socialize	8
Be with family/Son/Children/Spouse	6
Relax/Relaxation	5
Sunshine/Need the sun	5
Nature/Like nature	3
Claustrophobia/Hate to be confined in the house	3
Like sports	2
Pass time/Helps to pass the time/Keep busy	2
Weather	2
Clear mind/Take mind off work	2
Scenery	2
Individualism/Be by myself	1
Always did/Grew up	1
Get away from work/Diversion from work	1
For work/Working/Work purposes	1
Enjoy wildlife/Animals	1
Competition	1

Source: Presidents Commission on American Outdoors, 1986.

^a Top mentions only.

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Statewide Perspective

• General Trends

In recent years outdoor recreation use on Federal lands in Utah has averaged about 20 to 25 million visitor days per year. Growth prospects for the recreation industry in Utah are greater than for the Nation as a whole. The Utah birth rate and age structure of Utah's population are indicative of relatively high numbers of young people and active families. Also, recreation growth in Utah is influenced by the influx of people from other states (particularly to the Wasatch Front), as the Nation's population moves westward. Utah's reputation as a tourist destination for its national parks and ski resorts also will continue to influence recreational facilities and services. It is predicted that recreation participation would show the greatest increases nationally in the Rocky Mountain region (Cordell and Hendee, 1982).

Based on a review of several projections (UDNRE, ORA, 1980; UDNRE, DPR, 1985; Utah Office of Planning and Budget, 1984; Jungst, 1978; Cordell and Hendee, 1982; and Hof and Kaiser, 1981), it is estimated that outdoor recreation in Utah will increase at about 2 to 7 percent per year over the next 30 years. The 1985 Utah State Comprehensive Outdoor Recreation Plan (SCORP) estimated that recreation participation in Utah would increase by about 7 percent annually through the year 2000. The SCORP also stated that population growth in Utah is expected to be about 2 percent per year (UDNRE, DPR, 1985). Nationally, it is estimated that recreation will increase by about 2 percent per year until 2000 (Cordell and Hendee, 1982).

At a rate of 2 and 7 percent annually in the State through the year 2000, overall recreational use in WSAs is expected to increase from about 264,340 current visitor days per year to be between 497,868 and 1,725,861 visitor days by the year 2020. Better known areas probably will receive greater annual increases in use than will lesser known areas, while use in some WSAs where visitation limits are established by BLM land use plans (i.e., river recreation in the Desolation Canyon and Westwater WSAs) will increase only slightly. Studies indicated that wilderness designation does not substantially increase the amount of recreation use that would normally occur over the long term (McCool, 1985).

• Recreation Participation

All of BLM's WSAs, except for the North Stansbury Mountains, Cedar Mountains, the northern half of the Deep Creek Mountains, Winter Ridge and Daniels Canyon, are located in the Central, Southwest, and Southeast Utah Multi-County Districts (MCDs). In 1981, recreation visits to these three multi-county units totaled slightly less than 20 percent of outdoor recreation use for that year in Utah. About one-half of these visits were made by residents of the MCDs, while the remaining use came from people living outside the districts. In contrast, due to its relatively large resident population and its attractiveness to out-of-area visitors, the Wasatch Front MCD accounted for almost one-half of the State's total visitation.

Utah residents engaged in approximately 78 million recreation visits from March 1976 to February 1977. On the average that year, Utah residents each participated in 80 outdoor recreation visits (UDNRE, DPR, 1980). The 1985 estimated recreation demand was more than 148 million visitor days (UDNRE, DPR, 1985).

These figures include essentially all forms of both urban and rural outdoor recreation.

In 1988, about 3.7 million visits or 2.2 million visitor days of recreation use occurred in Utah on lands and waters administered by BLM. This use was distributed among various predominant activities, as shown on Figure 6. Compared to 1987, the 1988 use pattern reflects a decreased (down 11 percent) level of ORV and other motorized use and an increase (up a total of 12 percent) in hunting, hiking, and backpacking in Utah.

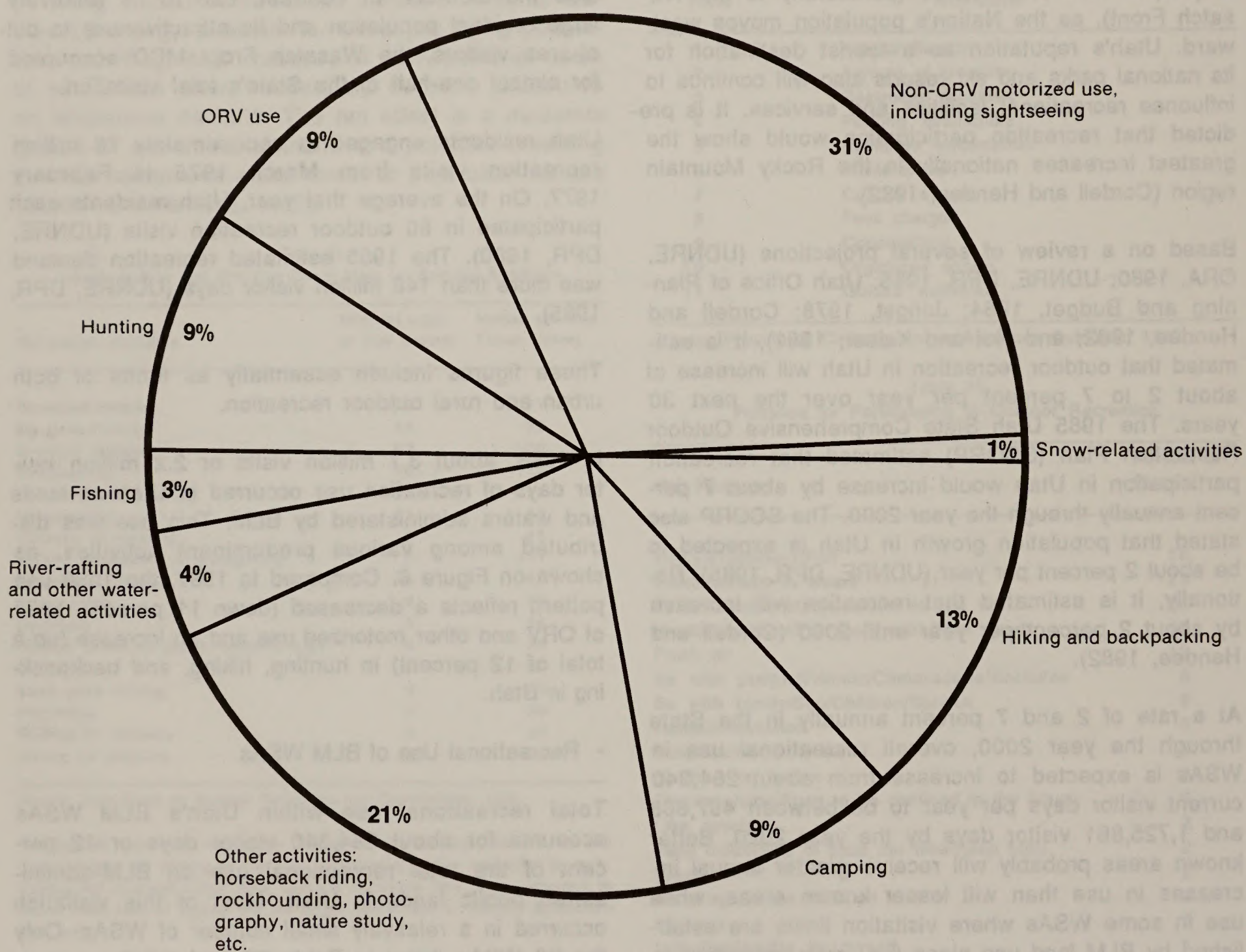
• Recreational Use of BLM WSAs

Total recreational use within Utah's BLM WSAs accounts for about 264,340 visitor days or 12 percent of the total recreational use on BLM-administered public lands in Utah. Most of this visitation occurred in a relatively small number of WSAs. Only the 26 WSAs listed in Table 66 had 1,000 or more visitor days of use.

Visitor use in WSAs is concentrated in a small number of relatively well known areas. The seven areas with 10,000 or greater visitor days (Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Grand Gulch, Dark Canyon, Desolation Canyon, and Westwater Canyon WSAs) account for about 72

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PUBLIC RECREATION USE ON BLM AREAS BY ACTIVITY UTAH, 1988



Source: BLM 1988 Facts and Figures for Utah

FIGURE 6

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percent of total WSA visitor use. These WSAs have become major destination areas for both Utah residents and out-of-State visitors seeking primitive forms of outdoor recreation. Desolation Canyon alone accounts for almost 27 percent of the total recreational use within WSAs.

Table 66
WSAs With 1,000 or More Estimated Visitor Days of Annual Use

WSA Name	Total Visitor Days
Deep Creek Mountains	8,000
Rockwell	3,960
Cottonwood Canyon	3,150
North Fork Virgin River	4,000
Orderville Canyon	1,000
Parunuweap Canyon	1,400
Moquith Mountain	6,000
Phipps-Death Hollow Complex	23,000
Steep Creek	10,050
North Escalante Canyons/The Gulch	32,350
Mt. Pennell	2,580
Mancos Mesa	1,200
Grand Gulch Complex	22,800
Road Canyon	2,000
Fish Creek Canyon	6,850
Cheesebox Canyon	1,000
Dark Canyon	17,000
Indian Creek	1,000
Behind the Rocks	1,840
Mill Creek	1,912
Negro Bill Canyon	3,370
Horseshoe Canyon (North)	2,260
Crack Canyon	1,500
Sids Mountain	2,500
Mexican Mountain	4,000
Desolation Canyon	70,000
Westwater Canyon	14,470

Source: WSA Analyses.

Recreation visitors to Utah BLM WSAs participate in a wide variety of recreation activities. Table 67 shows recreation activity participation for WSAs. Hiking and backpacking, ORV use, and hunting are the activities most frequently occurring in WSAs. River running, while occurring in only seven WSAs, accounts for a relatively large proportion of total recreational use. It is the dominant activity in Desolation Canyon and Westwater Canyon WSAs, which make up almost 32 percent of recreation visitor days for all WSAs.

Commercial recreation use of BLM areas in Utah is mainly related to the use of the Green River in the Desolation Canyon WSA, the Colorado River in the Westwater WSA, and lands in southeast Utah. Overall, approximately 58,600 visitor days of commercial use occurs in the WSAs. About 42,250 visitor days were water-based recreation with 37 river tour outfitters in two WSAs and the remainder were

derived from land-based activities, such as outfitting for big game or trips to see canyons with Anazasi ruins.

ORV use most often is associated with participation in another activity such as hiking and backpacking, geological sightseeing, fishing, and hunting. ORV play activity, by itself, does not account for a significant portion of vehicle use within WSAs.

Table 67
Types of Existing Recreation Activity in WSAs

Recreation Activity	Number of WSAs Where Activity Occurs
ORV use	63
Hiking/backpacking	70
Rafting	7
Rock climbing	12
Geologic sightseeing	26
Archaeologic sightseeing	12
Water play	2
Fishing	9
Hunting	42
Horseback riding	28
Nature study	20

Source: WSA Analyses.

Many of the recreation opportunities available in WSAs are rated outstanding by BLM. Seventy-three of the WSAs (88 percent) have outstanding opportunities for primitive and unconfined recreation in all or a portion of the WSA. Altogether, 2,041,467 acres (63 percent) of the 3,235,834 acres under study are judged to contain outstanding opportunities, based on either the diversity of opportunities present or the potential to support one or more recreation activities of outstanding quality. Hiking and backpacking opportunities are outstanding in 70 of the WSAs (see Table 67). Outstanding opportunities for rock climbing, geologic sightseeing, and water play opportunities are not utilized in some WSAs. However, opportunities for hiking and backpacking, archaeological sightseeing, horseback riding, and nature study are being used to some extent by the public in the WSAs where outstanding opportunities occur. Hunting and fishing are taking place in a number of areas considered to have less than outstanding opportunities.

The location of recreation opportunities partially determines how much visitor use they receive. Previously in this chapter (see Proximity to Population Centers and Table 30), information was given about designated and potential wilderness areas within a 5-hour driving time of major population centers.

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• Off-Road Vehicle Use Designation

BLM identifies public lands according to one of three ORV designation categories: open, limited, and closed. Under the limited category, ORV use is restricted in a specific way by requiring use to occur only on certain routes and/or during specified seasons.

Land use planning determines the appropriate ORV category for each area. The ORV designation process requires environmental analyses, publication of maps, and public notification. This is an ongoing process, with about 65 percent of BLM land in Utah now given ORV designations. Areas where ORV categories have not yet been established are assumed to be open to ORV use, for purposes of this EIS. At the present time, about 66 percent (2,156,158 acres) of the land within WSAs is open or undesignated, 18 percent (575,013 acres) is in the limited designation category, and 16 percent (504,663 acres) is closed to ORV use.

As land use planning proceeds, it is anticipated that additional areas currently undesignated would be designated as open, limited, or closed to ORV use. Wilderness designation is only one of the factors that could lead to ORV use restrictions. The need to protect other values such as soils, wildlife, watershed, historic, and prehistoric sites would result in additional limits placed upon ORV use at selected locations.

• Vehicle Ways Within WSAs

The 1980 Utah SCORP reported a total of 32,260 miles of ORV trails in Utah. While this figure may not include all ORV trails and ways, it does provide some insight into the magnitude of the ORV trail resource. The 1980 SCORP reports a total of 17,472 miles of ORV trails within the three MCDs (previously identified in this section) or about half of the total for the State. BLM identified 679.3 miles of vehicle ways within WSAs or about 4 percent of the total vehicle way miles within the three MCDs. Of the 679.3 miles of ways, 601.8 miles are open for vehicle use and 77.5 miles are closed by BLM land use plans.

Eighty percent (66) of the WSAs have vehicle routes within their boundaries. However, vehicle route penetration into WSAs has been substantially constrained by the rough terrain and relative isolation of most WSAs. During the BLM Intensive Wilderness Inventory (USDI, BLM, 1980), roads often were used as WSA boundaries. In some cases (such as Paria-Hackberry, Wahweap, North Escalante/The Gulch, and Road Can-

yon WSAs), cherry-stemmed roads or substantially noticeable ways penetrate deep into the WSA. The wilderness inventory also identified vehicle routes or ways that did not meet the definition of a road. Many of these ways were created solely by the passage of vehicles, while others were originally constructed as roads, but did not receive regular maintenance. In a few cases, the presence of existing access routes and limited topographic barriers present situations where conflicts between motorized and nonmotorized recreational use may occur. Hiking and backpacking and ORV use are the two activities occurring in the largest number of WSAs. Hiking and backpacking takes place in 70 of the WSAs and ORV use is present in 63 of the WSAs. For the most part, these activities are taking place in the same WSAs, since 55 WSAs are currently being used for hiking and backpacking and ORV recreation. BLM recreation specialists in Utah have identified two areas with significant nonmechanized/mechanized recreation use conflicts: Moquith Mountain and Crack Canyon. Depending on the season and level of use, conflicts are also likely to arise in the future in a number of other WSAs (such as Cedar Mountains, Paria-Hackberry, Devils Canyon, Sids Mountain, Mexican Mountain, Fish Creek Canyon, the Cockcomb, and Cheesebox Canyon WSAs).

LAND USE PLANS AND CONTROLS

National Ownership of Wilderness-Type Lands

Table 68 shows the land ownership related to remote rural lands in the east and west portions of the nation. Remote Federal lands in the west comprise 338.6 million acres or 47 percent of the total. Considering the degree of remoteness, 58.5 million acres of "wilderness and other very remote areas" are on Federal lands in the west.

Land Use Plans

The stated objective of wilderness management is to manage and protect wilderness areas on the public lands in such a manner as to leave them unimpaired for future use and enjoyment as wilderness. The priority of protecting wilderness would affect various existing land use plans and uses, as well as future uses. Affected plans may address specific WSAs or land adjoining the WSAs. Plans that specifically address lands within WSAs are BLM plans, State plans, county or local plans and, to a limited degree, private plans. Plans addressing adjoining lands would include

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Table 68
Distribution of Land by Degree of Remoteness Among Federal, State,
and Private Rural Lands in the Contiguous States

Supplier by Region	Degree of Remoteness			Total
	Wilderness and Other Very Remote Areas	Extensive Back-Country Areas 1/2 to 3 Miles to Roads	Areas Near Roads and Partially Developed	
Million Acres				
East				
Private ^a	(b)	1.9	160.7	162.6
State ^c	7.5	4.3	26.8	38.6
Federal	5.3	5.4	19.9	30.6
Subtotal	12.8	11.6	207.4	231.8
West				
Private ^a	(b)	36.4	97.8	134.2
State ^c	0.5	1.3	12.6	14.4
Federal	58.5	77.3	203.3	338.6
Subtotal	58.5	115.0	313.7	487.2
Total	71.3	126.6	521.1	719.0
Row Percent	9.9	17.6	72.5	100.0

Source: Task Force on Outdoor Recreation and Opportunities, 1988.

^aArea based only on those private lands that are estimated to be available and open to the general public for recreation on a free or for-a-fee basis similar to public lands. Excludes all private owner-ships less than 20 acres in size which represent the large majority of private ownerships, but a relatively small part of the privately held acreage, less than 10 percent. Also excludes private lands that are posted or otherwise not open to the general public for recreation but where neighbors, friends, relatives, and others asking permission for recreation use are permitted special access for recreation purposes. Such acreage is very large, encompassing as much as an additional 500 million acres.

^bAny private, remote lands are included as extensive back-country areas.

^cincludes State parks, forests, fish and game areas, and other State lands available for public access.

all of the preceding, plus FS plans, NPS plans, and Indian reservation plans.

All WSAs are located in areas with an approved BLM Management Framework Plan (MFP) or Resource Management Plan (RMP). MFPs are early and use plans that are being replaced by RMPs, on a Statewide BLM schedule. Of the 83 WSAs, 21 are in areas covered by RMPs, 60 are in areas with MFPs, and two are partly with RMPs and MFPs. The No Action/No Wilderness alternative analyzed in the Final EIS is to manage according to the existing land use plans. The BLM Pony Express RMP covers lands with three WSAs, the San Juan RMP covers lands with ten WSAs, and the San Rafael RMP covers lands with six WSAs. These RMPs are not addressed in the Final Wilderness EIS because the final terms, conditions, and decisions of the plans were uncertain when the Final Wilderness EIS was prepared. Due to the Statewide wilderness process, Utah RMPs do not specifically address wilderness designation. Rather, they define how WSAs would be managed if not designated wilderness by Congress.

Approximately 206,841 acres in 51 WSAs presently are included in special land use designations such as public water reserves, power project withdrawals, oil shale withdrawals, natural areas withdrawals, etc. These are specifically identified where applicable in the individual WSA analyses. About 376 miles of streams in 15 WSAs have been identified for review for future wild and scenic river consideration (USDI, NPS, 1982).

Designation of Areas of Critical Environmental Concern (ACEC)

The FLPMA defines ACECs as "areas within the public lands where special management attention is required . . . to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards." FLMPA further requires that the Bureau "give priority to the designation and protection of" ACECs, and that ACECs will be identified, analyzed, and designated through the BLM's planning process, with full public participation.

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ACEC designation is not equivalent to wilderness designation nor does it constitute a withdrawal, although a withdrawal may be considered necessary to protect the particular values within an area. Nor are ACECs necessarily coincident with or confined to WSAs. The criteria used to determine eligibility of an area for ACEC nomination are (1) relevance, meaning that special management attention is required to protect the values in the area; and (2) importance, meaning qualities that give the area special worth, distinctiveness, or concern that is of more than local significance. A variety of multiple-use activities may take place within an ACEC, so long as they are compatible with the primary management objective of the ACEC.

Some parts of public lands have special designations, such as outstanding natural area, research natural area, and primitive area. Although these terms may be used in conjunction with the term ACEC to indicate

the general purpose for an area's designation, they are no longer valid labels. Areas such as Dark Canyon, Grand Gulch, Negro Bill Canyon, and No Man's Mesa (Paria-Hackberry WSA), which have been specially designated, will be titled as ACECs and managed to protect the special values.

Recent RMPs and plan amendments in southern and western Utah have addressed ACEC nomination for parts or all of certain WSAs. Table 69 lists the ACECs formally designated to date which are associated with WSAs. All RMPs prepared by BLM in Utah will address ACEC designation for critical areas. ACEC nominations are consistent for a variety of reasons, including watershed protection, high primitive recreation values, scenic values, and research potential. The reasons and management objectives of ACEC designation are listed in the Affected Environment section of the individual WSA analyses.

Table 69
BLM Areas of Critical Environmental Concern (ACECs) Affecting WSAs

WSA	BLM Plan	Name of ACEC	Objectives
Deep Creek Mountains (Juab County portion) (68,910 acres)	House Range RMP	Deep Creek Mountains SMRA ¹ and ONA ² (30,740 acres)	<ul style="list-style-type: none"> • Protect outstanding natural qualities • Preserve recreation values
Rockwell (9,150 acres)	House Range RMP	Rockwell ONA ² (9,630 acres)	<ul style="list-style-type: none"> • Protect outstanding natural qualities
Notch Peak (51,130 acres)	Warm Springs RMP	Notch Peak ³ NNL ⁴ (9,000 acres)	<ul style="list-style-type: none"> • Protect outstanding natural qualities • Preserve recreation values
Wah Wah Mountains (42,140 acres)	Warm Springs RMP	Wah Wah Mountains RNA ⁵ (5,970 acres)	<ul style="list-style-type: none"> • Protect ecological, scenic, geologic, and scientific values
Wah Wah Mountains (42,140 acres)	Warm Springs RMP	Crystal Peak ³ ONA ² (640 acres)	<ul style="list-style-type: none"> • Protect scenic and recreational values
Moquith Mountain (14,830 acres)	Vermillion MFP Amendment	South Fork Indian Canyon RNA ⁵ (40 acres) and Water Canyon RNA ⁵ (185 acres)	<ul style="list-style-type: none"> • Protect scenic, recreational, botanical, and biological values
Paria-Hackberry (136,222 acres)	Vermillion MFP Amendment	No Man's Mesa RNA ⁵ (1,335 acres of public land)	<ul style="list-style-type: none"> • Protect educational, scientific, and scenic values
Mt. Ellen-Blue Hills ⁶ (81,726 acres)	Henry Mountain MFP Amendment	Gilbert Badlands (3,680 acres) and South Cainville Mesa (4,100 acres)	<ul style="list-style-type: none"> • Protect educational and scientific values • Protect natural qualities

Source: BLM File Data.

¹ SMRA - Special Management Recreation Area.

² ONA - Outstanding Natural Area.

³ Proposed for ACEC designation if not designated wilderness by Congress.

⁴ NNL - National Natural Landmark.

⁵ RNA - Research Natural Area.

⁶ Pending ACECs not listed in San Juan and San Rafael Areas because RMPs not final at the time wilderness EIS was written.

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Fourteen county plans in Utah and one in Nevada (Lincoln) interact with this wilderness study (see Table 6). Table 70 shows the WSA acreage that county organizations formerly have recommended for wilderness designation. The Garfield County Master Plan (Five County Association of Governments, 1984) has proposed that 111,053 acres of BLM lands in three WSAs and 31,000 acres in one National Forest be designated wilderness. All other county plans either recommend public lands be managed for multiple use (range, agriculture, mining, etc.) to strengthen the county's economy, or they do not specifically address wilderness designation. Some of the county plans, however, recommend that areas with outstanding resource values be preserved.

Table 70
WSAs Recommended for Wilderness Designation
by County Organizations^a

County	WSA Number	WSA Name	Acreage
<u>Six County Wilderness Proposal^b</u>			
Juab	3	Deep Creek Mountains	28,840
	4	Fish Springs	30,200
Millard	6	Swasey Mountain	32,000
	12	Wah Wah Mountains	35,000
	9	Notch Peak	9,000
Wayne	G	Fremont Gorge	2,800
	38	Dirty Devil	61,000
	39	Horseshoe Canyon	25,000
	36	Mt. Ellen	14,640
Six County Total			241,480
<u>Garfield County Wilderness Proposal^c</u>			
	30	Steep	13,850
	31	North Escalante Canyons/ The Gulch	53,447
	29	Phipps-Death Hollow	39,256
Garfield County Total			111,053

^aPlans may not necessarily reflect the current position of county officials.

^bAdopted by the Six County Commissioners Organization, June 12, 1983.

^cGarfield County Master Plan (Five County Association of Governments, 1984).

The Six County Commissioners Organization (involving Millard, Juab, Sanpete, Sevier, Piute, and Wayne Counties) on June 12, 1983, recommended 241,480 acres of public lands as suitable for wilderness designation in their six-county area. Nine WSAs were involved in this recommendation (see Table 70).

The government of the State of Utah and several county governments view wilderness as a single use of public lands. The present policy is that Utah has enough wilderness and other single use designations and the remainder of the State's Federally owned lands should be left under multiple-use management for economic reasons.

In a statement dated May 15, 1986, Governor Norman Bangerter conveyed his opposition to further wilderness designation in the State of Utah until it is proven that wilderness is in both the nation's and the State's best interest (see Volume VII-A, comment letter S-1).

In 1986, the State Legislature issued a resolution opposed to wilderness (S.C.R. No. 1). Four specific provisions are essential to the BLM wilderness review: (1) the Legislature, with the Governor concurring, is opposed to any further designation of wilderness in Utah; (2) the Legislature disagrees with the Sierra Club vs. Block decision regarding wilderness reserve water rights as being counter to the interests of the West, this State, and its citizens; (3) the Legislature urges Congress to modify the FLPMA to exclude any State with greater than 30% Federal ownership from the provisions of the 1964 Wilderness Act; and (4) the Legislature urges the State Land Board not to trade any State sections out of any BLM Wilderness Study Area (Utah State Legislature, 1986).

A "Consolidated Local Government Response to Wilderness (Utah Counties, 1986)" was drafted and endorsed by several counties in the State. Those counties participating are as shown in Table 71.

Table 71
Counties Represented by
Consolidated Local Government Response to Wilderness

Box Elder County ^a	San Pete County ^a
Carbon County	Sevier County ^a
Emery County	Six County Commissioners Organization
Garfield County	Southeastern Utah A.O.G.
Grand County	Tooele County
Juab County	Uintah County
Millard County	Washington County
Piute County	Wayne County
San Juan County	

Source: Utah Counties (1986).

^aNo BLM WSAs in the county.

These counties identify several "unevaluated and unaddressed" conflicts inherent in wilderness designation

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and oppose any further designation of BLM lands until these issues can be resolved. The Consolidated Local Governments find the existence of open-ended potential for increasing Federal regulation and environmental litigation unacceptable. Specific conflicts identified include (1) impacts due to peripheral zones of influence, (2) interagency transfers, (3) law suits attendant to air quality degradation over otherwise pristine areas, (4) the court ordered wilderness reserve water right, and (5) restrictions on the use of in-held State lands (see Volume VII-A, comment letter LCO-1).

Proposed Development Projects in WSAs

Eight WSAs (including Parunuweap, North Fork Virgin River, Cottonwood Canyon, Devils Canyon, Sids Mountain, Steep Creek, North Escalante Canyons/The Gulch, and Mt. Pennell) are identified by county or joint government plans for development.

Washington County Water Conservancy District has proposed construction of a reservoir within the Parunuweap WSA on the East Fork of the Virgin River with a damsite near the junction of the river and the east boundary of Zion National Park. They also have identified an alternate site where Mineral Canyon joins the East Fork. The storage capacity of the proposed reservoir would be approximately 35,000 acre-feet.

The UDWR has completed reconnaissance surveys for nine reservoir sites on the North Fork of the Virgin River. One of these sites is adjacent to the North Fork Virgin River WSA. Washington County has indicated interest in possible development of the North Fork of the Virgin River to meet future water needs. At the present time, no applications have been filed with BLM for these reservoir projects.

The city of St. George has a water right for 1,500 acre-feet of water from a known aquifer within Cottonwood Canyon WSA. A temporary well was drilled and developed in the WSA with the stipulation that it be removed if the WSA is designated wilderness. Further development proposals for this aquifer are expected. The St. George water system contributes water to six local communities: Ivins, Santa Clara, St. George, Bloomington, Bloomington Hills, and Washington.

Garfield County, with the support of other counties in southern Utah, has been authorized to upgrade the Burr Trail Road within a county rights-of-way between Boulder, Utah, and Bullfrog Marina on Lake

Powell. Upgrading the Burr Trail involves the edge of the Steep Creek, North Escalante Canyons/The Gulch, and Mt. Pennell WSAs. This has been a controversial issue subjected to court hearings and appeals.

Portions of the pre-FLPMA right-of-way for Interstate Highway 70 (I-70) were inadvertently included in the Devils Canyon and Sids Mountain WSAs. Eventual development in the right-of-way would affect these WSAs.

Private plans that could be impacted by wilderness designation generally are conceptual and lack formal applications. They include plans for water diversions and developments, transportation access routes, utility corridors, etc.

There are some private projects that have formal applications. Two small private water diversion structures for hydroelectric generating projects have been proposed within the Deep Creek Mountains WSA. Most features of these projects would be adjacent to and outside of the WSA; however, water diversion pipelines could extend for a short distance (0.2 mile) into the WSA. Rights-of-way for these water resource developments have been issued; however, as of June 1989, no construction has been carried out pending approvals from the Federal Energy Regulatory Commission. A small diversion dam to periodically divert irrigation water has been proposed on Rock Creek in the Desolation Canyon WSA.

A cooperative study between the Department of the Interior and State of Utah considered various transportation corridors related to potential mining and transportation of Kaiparowits Plateau coal. The study identified various development scenarios and transportation corridors (ERT, 1980). Approximately ten WSAs are included in the various corridors studied. Some of the Kaiparowits coal is leased, but there presently is no suitable access from the coal fields to transportation networks for markets outside the region. The most significant physical constraints are the Paria Box and The Gut in the Paria-Hackberry and Wahweap WSAs. It is likely that transportation facilities could be routed around the BLM WSAs.

The Western Utility Group has developed a utility corridor map showing their needs through the year 2020 (WUG, 1986). Most of the corridors follow existing transportation routes or existing powerlines or are located in areas where topography is not too rough. Therefore, few, if any, WSAs would be involved.

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The potential for water yield augmentation through cloud seeding has been identified for areas where there is an orographic barrier of greater than 2,000 feet and elevations of greater than 7,500 feet above sea level. WSAs with these characteristics are mainly in the West Desert, Book Cliffs, and Henry Mountains. Cloud seeding would require placement of equipment in some WSAs. The status of the project is uncertain.

COMMUNICATION SITES

There are three criteria necessary for a communication site: access, power, and the ability for the signal to reach its intended recipients. The last is most important; however, in mountainous terrain some compromise is often made with each criterion.

Radio communication takes several forms, most of which transmits along a line of sight, the major exception being AM commercial broadcasting. Commercial FM radio and television stations place their primary transmitters as high as they can to reduce tower construction costs and improve coverage. Stations demand commercial power and reasonably good access. In mountainous terrain, repeater stations are also placed on mountain tops. Repeater sites for commercial radio and television stations have been established outside of WSAs, and only if extended coverage is desired from low-powered television stations would additional repeater sites be needed.

Many commercial users and several governmental agencies (including the military) maintain microwave radio networks. In areas of poor telephone line quality, microwave radio may be essential. In mountainous terrain, the best place to put microwave repeater stations is on mountain tops. Because of the crowded frequency spectrum, it will be necessary to establish additional microwave sites in Utah. Mt. Pennell has already been identified as a desirable site.

Most mobile two-way radios are FM and are line of sight. Although the control site for radio communications in mountainous terrain may be in the valley, the transmitters are likely to be on mountain tops. BLM has several two-way mobile radio repeater sites in WSAs: on Swasey Peak, on the Fifty Mile Cliffs at the edge of the Kaiparowits Plateau, and on Mt. Ellen in the Henry Mountains. All of these are solar-powered and have poor access. These sites were established before WSAs were delineated. Several telephone company microwave sites and other major users have installations near the edges of WSAs (e.g., there is a

telephone company site on the south side of U.S. 6 in the Confusion Range).

Most modern two-way radios, while broadcasting, are line-of-sight transmission; consequently, from any transmitter there are large areas of "radio shadow," areas deep in canyons or behind mountains that cannot receive from nor transmit to the mountain top station. Utah BLM provides about 85 percent of mobile radio coverage, but large areas of "radio shadow" exist in the Book and Roan Cliffs areas, in the canyons of eastern San Juan County, and along the south half of the Utah-Nevada border. Undoubtedly, other mobile radio users have "radio shadow" areas in their systems that may require additional repeater sites to improve coverage.

The Fish Springs WSA has one U.S. Air Force High Accuracy Multiple Object Tracking System (HAMOTS) site in place and Conger Mountain WSA has two. HAMOTS facilities consist of 24-foot high antennas with associated braces, solar panels, and batteries. HAMOTS provides for radar-tracking of air launched cruise missiles. There are several such sites in the Utah Test and Training Range (western Utah and eastern Nevada). Rights-of-way for the facilities were issued in 1985. The temporary rights-of-way were issued for up to 3 years and can be renewed. Access to the HAMOTS sites is limited to walking or by helicopter. The facilities are considered to be nonimpairing under interim wilderness management, but they would be removed in accordance with the BLM Wilderness Management Policy (BLM Manual 8560) if the WSAs are designated wilderness.

Land Ownership Within and Adjacent to WSAs

• Private In-holdings

There are 3,998 acres of private in-holdings within eight of the WSAs. Most of the private land in-holdings are small, less than one half of a section. Refer to Table 72 for a description of land ownership. No specific plans for management of these lands are known.

• State In-holdings

There are 294 sections (183,248 acres) of State land in-held in 52 of the BLM WSAs. In addition, there are 10,272 acres of split State lands with State minerals in-held in 12 WSAs.

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Table 72
Summary of State and Private Land Ownership
Within WSAs

Types of Ownership	Number	Acres	Number of WSAs
Private in-holding parcels	16	3,998	8
State in-holding sections	294	183,248	52
Private and Federal surface, State mineral sections	25.25	10,272	12

Source: Appendix 3.

The State of Utah has not adopted a comprehensive plan for the in-held State sections. The State Land

Board manages these sections for the benefit of public schools. Lands generally are leased for livestock grazing and mineral exploration and development. Of the 183,248 acres of in-held State lands, 128,587 acres were under grazing permit and 79,559 acres were leased for minerals in 1987 (UDNRE, DSLF, 1988).

• Adjacent Lands

Fifty BLM WSAs share common boundaries with other agency lands as shown in Table 73. NPS lands adjoin 31 WSAs for a total of 245.5 miles.

Table 73
Adjacent Agency Land

WSA Name	Common Boundary	Adjacent Administrative Unit
<u>National Park Service</u>		
LaVerkin Creek Canyon	1.25	Zion National Park
Deep Creek	3.0	Zion National Park
North Fork Virgin River	0.5	Zion National Park
Orderville Canyon	1.5	Zion National Park
Parunuweap Canyon	4.75	Zion National Park
Canaan Mountain	9.0	Zion National Park
Burning Hills	10.0	Glen Canyon National Recreation Area
North Escalante Canyons/The Gulch	13.0	Glen Canyon National Recreation Area
Scorpion	17.0	Glen Canyon National Recreation Area
Escalante Canyon Tract 5	2.0	Glen Canyon National Recreation Area
Fifty Mile Mountain	14.0	Glen Canyon National Recreation Area
Horseshoe Canyon (South)	7.5	Canyonlands National Park (1 mile), and Glen Canyon NRA (6.5 miles)
French Spring-Happy Canyon	8.0	Glen Canyon National Recreation Area
Fiddler Butte	33.5	Glen Canyon National Recreation Area
Little Rockies	19.5	Glen Canyon National Recreation Area
Mancos Mesa	20.0	Glen Canyon National Recreation Area
Grand Gulch	8.5	Glen Canyon National Recreation Area
Dark Canyon	27.5	Canyonlands National Park
Butler Wash	12.0	Canyonlands National Park
Indian Creek	7.5	Canyonlands National Park
Horseshoe Canyon (North)	1.25	Glen Canyon National Recreation Area
Red Butte	1.25	Zion National Park
Spring Creek Canyon	3.0	Zion National Park
The Watchman	1.75	Zion National Park
Taylor Creek Canyon	0.5	Zion National Park
Goose Creek Canyon	0.5	Zion National Park
Beartrap Canyon	0.25	Zion National Park
Fremont Gorge	2.0	Capital Reef National Park
Lost Spring Canyon	3.5	Arches National Park
Daniels Canyon	2.5	Dinosaur National Monument
South Needles	1.0	Canyonlands National Park
Total NPS	245.5	

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Table 73 (Continued)
Adjacent Agency Land

WSA Name	Common Boundary	Adjacent Administrative Unit
<u>US Forest Service</u>		
North Stansbury	4.0	Wasatch National Forest
Cougar Canyon	10.0	Dixie National Forest
Cottonwood Canyon	6.5	Dixie National Forest
The Blues	12.5	Dixie National Forest
Mud Springs Canyon	4.0	Dixie National Forest
Phipps-Death Hollow	10.75	Dixie National Forest
Steep Creek	11.0	Dixie National Forest
Mule Canyon	2.25	Manti-LaSal National Forest
Dark Canyon	3.0	Manti-LaSal National Forest
Mill Creek Canyon	1.25	Manti-LaSal National Forest
Total USFS	65.25	
<u>US Fish and Wildlife Service</u>		
Fish Springs	2.0	Fish Springs National Wildlife Refuge
Total FWS	2.0	
<u>Indian Reservation Lands</u>		
Deep Creek Mountains	7.5	Goshute Indian Reservation
Moquith Mountains	5.5	Kaibab-Paiute Indian Reservation
Desolation Canyon	68.0	Uinta-Ouray Indian Reservation
Floy Canyon	5.0	Uinta-Ouray Indian Reservation
Total Indian	86.0	
<u>State Agency Lands^a</u>		
Cougar Canyon	7.0	Nevada-Beaver Dam State Park
Red Mountain	6.0	Utah-Snow Canyon State Park
Moquith Mountain	1.0	Utah-Coral Pink Sand Dunes State Park
Coal Canyon	5.0	Utah-State Roadless Area
Spruce Canyon	6.0	Utah-State Roadless Area
Flume Canyon	2.0	Utah-State Roadless Area
Total State Agency	36.0	

Source: BLM File Data.

^aDoes not include individual, scattered State sections.

The NPS has reviewed all national park system lands in Utah for wilderness suitability and has recommended that 1,264,431 acres be designated wilderness. Twenty-eight of the BLM WSAs (excluding Burning Hills, French Spring-Happy Canyon, and Horseshoe Canyon [South]) adjoin lands recommended by the NPS for wilderness designation, with about 213 miles of common boundary.

National Forest lands adjoin 10 WSAs for a total of 65.25 miles. FS land use plans could be affected in these areas. The FS has completed a review of National Forest land for wilderness designation, and a total of 802,238 acres in Utah has been designated wilderness. Two BLM study areas (Phipps-Death Hollow and Dark Canyon) adjoin FS designated wilderness areas for 13.75 miles.

Three Indian reservations (Uintah-Ouray, Kaibab-Paiute, and Goshute) are adjacent to four WSAs for a common boundary of about 86 miles. A portion of the Hill Creek Extension (413,000 acres) of the Uintah and Ouray Indian Reservation is being managed to preserve its primitive values. Two WSAs, Desolation Canyon and Floy Canyon, are adjoining this area. The Moquith Mountain WSA adjoins the Kaibab-Paiute Reservation along 5.5 miles of common boundary in an area that the tribe has proposed for oil and gas exploration. No particular plans have been identified in the Goshute Reservation that adjoins the Deep Creek Mountains WSA along 7.5 miles of common boundary.

The Utah Navajo Development Council has expressed opposition to wilderness designation for the Road Canyon and Fish Creek Canyon WSAs because designation would interfere with collection of firewood and other

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natural products (Utah Navajo Development Council, 1986).

A portion of the Book Cliffs State Forest (approximately 13 miles of common boundary) is managed as a roadless area to preserve its primitive values. Three WSAs (Spruce Canyon, Coal Canyon, and Flume Canyon) are adjacent to this area. In addition, Cougar Canyon WSA, which is partially in Nevada, has 7 miles of boundary adjacent to a Nevada State Park, and the Red Mountain WSA has 5 miles of common boundary with Snow Canyon State Park.

AIRCRAFT OVERFLIGHTS

The West-Central Region (West Desert) is within the South Range of the U.S. Air Force's Utah Test and Training Range. The South Range runs approximately north and south from the southern boundary of the Bonneville Salt Flats to the San Francisco Mountains and east to west from the Sheeprock Mountains to 17 miles within Nevada. This is one of the Nation's busiest military air spaces. There are 15,000 aircraft, including all types of tactical fighters and bombers, in the area. There are 100 to 150 aircraft flights per day over the area 6 days per week (conservative estimate). Flights occur as low as 100 feet above the ground surface. Speeds are subsonic except in the very northern portion of the test range in the area around Ibapah, where supersonic speeds are also reached. Heaviest use areas are in the northern part of the test range, which includes Box Elder, Tooele, and Juab Counties (Davies, 1985). The most affected are the North Stansbury, Cedar Mountains, Fish Springs, Deep Creek Mountains, and Swasey Mountain WSAs.

Three WSAs in the South-West Region (Cougar Canyon, Cottonwood Canyon, and Red Mountain) are near flight paths of military aircraft from Nellis Air Force Base. Flights are generally subsonic and flight frequency is two or three times a week.

A U.S. Air Force Strategic Air Command low level training route passes over the Grand Gulch, Road Canyon, Escalante Canyon Tract 5, Scorpion, North Escalante Canyon/The Gulch, Fifty Mile Mountain, Carcass Canyon, Burning Hills, Death Ridge, Wahweap, Mud Springs Canyon, Paria-Hackberry, and Cockscomb WSAs. This route is traveled by approximately 90 sorties (flights) of B-1B, B-52, and FB-111 aircraft per year. These aircraft fly as low as 400 feet over the WSAs.

The U.S. Air Force policy is that low level training missions are essential to the national defense and cannot be compromised. The U.S. Air Force will not negotiate nor sign any agreement to avoid the proposed wilderness areas (USAF, 1986).

SOCIOECONOMICS

Demographics

Although wilderness considerations may have broad national demographic implications (at least to a some degree for those who may wish to relocate near certain wilderness areas), this would not be traceable information for analysis in the context of the Utah BLM wilderness review process. Those moving into the region often cite natural outdoor opportunities as one factor, but this may not have any direct or specific correlation with wilderness designation.

The primary area of direct influence between WSAs and population trends essentially is the State of Utah. Demographically, Utah is comprised of: (1) a major urban region, which extends along the western edge of the Wasatch Mountains (commonly termed the "Wasatch Front"), and (2) a rural, sparsely populated area which includes the remainder of the State. Within this generally rural area are local population centers (Cedar City, Logan, Moab, Price, Richfield, St. George, and Vernal) and other, smaller communities. The demographic distribution is depicted on Figure 7.

The total Utah population in 1987 was 1.68 million. The present population is projected to be about 1.77 million. Population is expected to increase to be about 2.02 million by the year 2000, and 2.4 million by the year 2010 (Utah Office of Planning and Budget, 1987). This is considered to be a "baseline" and does not reflect influences, if any, from the designation or nondesignation of BLM wilderness areas. The baseline reflects the future generally with the existing economic structure and the changing demographic characteristics of the population. It depicts the direction and possible results of current trends without major changes in the economic base, through the use of the UPED socio-economic model. The population projections reflect a combination of diverse factors, including a traditionally high (but substantially declining) birth rate in Utah, as well as a stagnant economy in many rural counties, with resultant periods of outmigration. While the total Utah population is projected to increase, the rate of change is expected to be uneven across the State, as illustrated in Figure 8.

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POPULATION PER SQUARE MILE FOR UTAH COUNTIES

1987

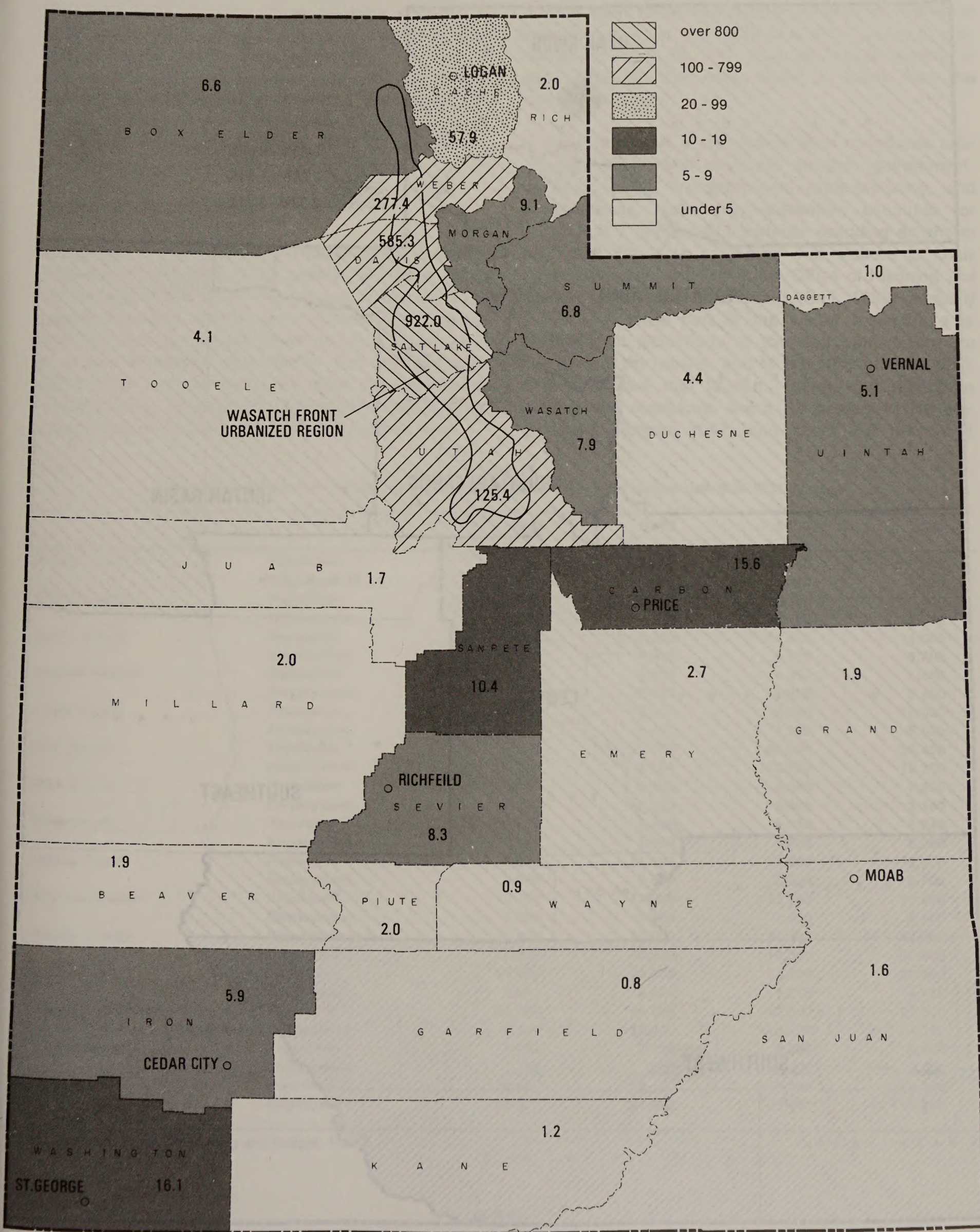
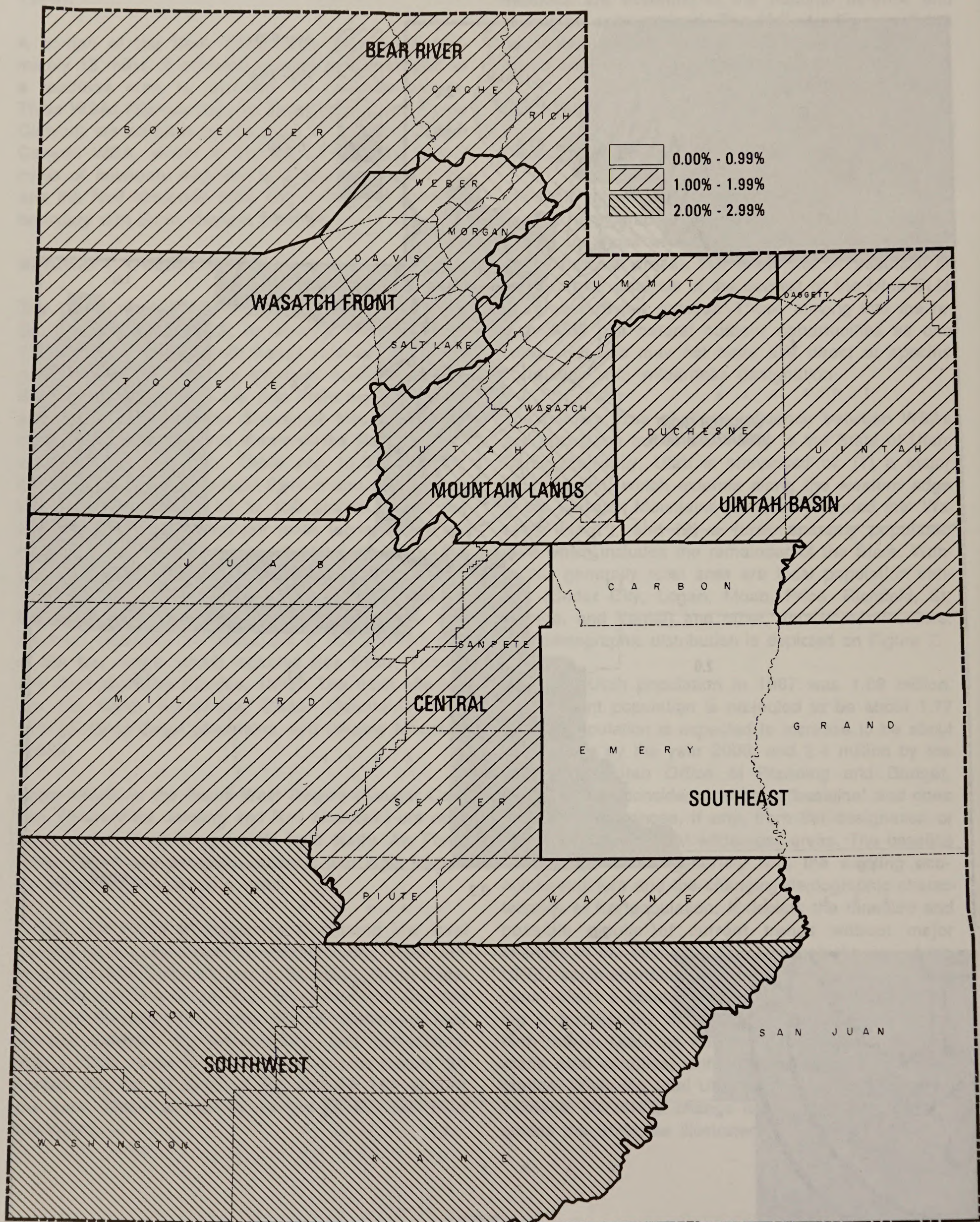


FIGURE 7

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MULTI-COUNTY DISTRICTS 1980-2010 POPULATION CHANGE



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The BLM WSAs are located in 14 Utah counties. Acreage data for these counties is presented in Table 6. The 1990 population for these fourteen counties is estimated to total about 215,000, or about 12 percent of the Statewide population. By 2010, the 14 counties are expected to have about 280,000 people and will continue to have about 12 percent of the State's population, but most of the growth will be in five of the 14 counties (Carbon, Iron, Tooele, Uintah, and Washington) as shown in Table 74.

Statewide Employment

During the 1970s and early 1980s Utah's economy experienced relatively rapid growth, primarily along the Wasatch Front urban region, and in several other specific locations where major construction projects occurred. Non-agricultural employment in all economic sectors increased significantly. The activities providing large employment gains were defense-related manufacturing, housing and powerplant construction, educational institutions, financial institutions, and

service industries. During the mid and late 1980s, the economic growth has slowed and is generally becoming more trade and service oriented. A Statewide overview of major industries and employment is presented in Table 75. The Utah per capita income is about \$12,000 per year, which is lower than the national average.

A major emphasis on tourism in Utah contributes substantially to several economic sectors (government, services, trade, transportation, manufacturing, and construction). Nationally, recreation accounts for about 5 to 7 percent of consumer spending as shown on Table 76. It is estimated that visitors to Utah spend between 1.3 billion (Utah Office of Planning and Budget, 1986) and \$2.2 billion (Ball, 1989) annually in Utah. A large part of the visitor expenditure is attributed to attractions in the Salt Lake Valley, to the several ski resorts, and to the NPS units in Utah. It is estimated that tourism, travel, and recreation employment constitutes about 7.8 percent of the employment (Robson, 1987) and about 5.2 percent of

Table 74
Baseline and Projected Population and Employment Growth for Utah Counties with BLM WSA Acreage

		1980	1990	2000	2010
Beaver County	Population	4,400	5,200	5,500	6,200
	Employment	1,585	2,000	2,300	3,000
Carbon County	Population	22,400	23,400	23,200	28,000
	Employment	9,372	9,400	10,700	13,000
Emery County	Population	11,600	12,000	11,900	14,000
	Employment	5,480	4,900	5,500	6,700
Garfield County	Population	3,700	4,250	4,350	4,850
	Employment	2,156	2,000	2,200	3,200
Grand County	Population	12,400	12,900	12,900	15,000
	Employment	3,980	3,800	4,300	5,100
Iron County	Population	17,500	21,000	22,500	26,400
	Employment	6,968	8,600	10,500	12,300
Juab County	Population	5,550	5,900	6,200	7,250
	Employment	2,265	2,300	2,600	3,100
Kane County	Population	4,050	5,250	5,750	6,950
	Employment	1,403	1,900	2,300	2,900
Millard County	Population	9,050	11,000	11,600	12,900
	Employment	3,645	5,500	6,000	6,700
San Juan County	Population	12,400	12,900	12,900	15,000
	Employment	3,980	3,800	4,300	5,100
Tooele County	Population	26,200	30,000	35,000	42,700
	Employment	10,649	12,200	14,300	16,600
Uintah County	Population	20,700	23,700	25,500	32,900
	Employment	8,211	9,400	11,200	14,400
Washington County	Population	26,400	45,500	51,000	65,600
	Employment	8,100	14,400	18,400	24,100
Wayne County	Population	1,950	2,150	2,200	2,550
	Employment	783	800	800	1,000
Totals	Population	178,300	215,150	230,500	280,300
	Employment	68,577	81,000	95,400	117,200

Source: Utah Office of Planning and Budget, 1987.

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Table 75
Statewide Summary of Major Industries and Employment

Multi-County District (MCD) ^a	Major Industries and Employment ^b
Bear River	- Manufacturing (15.1), Government (10.4), Trade (7.5), Services (5.1), Agriculture (3.8).
Central	- Government (4.1), Agriculture (3.5), Trade (3.4), Nonfarm Proprietors (2.8), Services (2.3).
Mountainlands	- Services (30.6), Trade (19.0), Government (15.5), Manufacturing (11.2), Nonfarm Proprietors (7.0).
Southeast	- Government (4.1), Trade (3.6), Mining (3.5), Services (3.2), Nonfarm Proprietors (2.0).
Southwest	- Trade (6.8), Government (5.8), Services (5.1), Nonfarm Proprietors (3.1), Manufacturing (2.0).
Utah Basin	- Government (3.1), Trade (2.9), Services (2.3), Nonfarm Proprietors (1.8), Mining (1.7).
Wasatch Front ^c	- Trade (126.4), Services (116.5), Government (103.8), Manufacturing (70.6), Nonfarm Proprietors (35.1).

Source: Utah Office of Planning and Budget, 1987.

^aSee Figure 8 for MCD locations.

^bThe top five categories are shown for each MCD. Numbers in parentheses represent estimated 1990 employment, in thousands, for each category. A more detailed listing is included as applicable for each WSA in Volumes II through VI.

^cBoundaries for this MCD as depicted on Figure 8 are not the same as for the more general use of the phrase "Wasatch Front".

wage and salaries in Utah. Comparison of these two figures suggests that tourism-related jobs are relatively low paying. However, with projected changes in the industrial mix to include more trade and service industries, the tourism, travel, and outdoor recreation activities likely will become increasingly important to the economic health of Utah (Utah Office of Planning and Budget, 1985).

Table 76
National Consumer Spending for Total Recreation

Year	Billion 1982 Dollars	Percent of Total Consumer Spending	Spending in Dollars per Capita
1970	98.4	6.6	480
1980	125.0	6.2	549
1983	136.8	6.4	583
1986	132.5	5.5	549

Source: ORNC, 1988.

It is estimated that about 148 million visitor days of recreation use occur in Utah, contributing to tourism employment of from 47,000 to 48,000 people (Utah State Economic Coordinating Committee, 1988), including the services of about 600 to 700 commercial outfitters. Table 77 shows the estimated value of recreation on BLM-administered land in Utah. Of the

Statewide total, about 250,300 visitor days are estimated to be within the 83 WSAs. Currently, about 59 outfitters use the WSAs. The outfitter use occurs within 20 WSAs, with the majority of the use involving three WSAs (Desolation Canyon, Westwater Canyon, and Grand Gulch).

Table 77
Estimated Economic Value of Recreation on Utah Public Lands - 1988

Activity	Recreation Visitor Days	Value per Day	Total Value
Camping and Picnicking	666,000	\$14.20	\$ 9.5 million
Motorized Travel (Sightseeing)	665,000	6.70	4.5 million
Hiking and Horseback Riding	273,000	20.76	5.7 million
Fishing	38,900	23.35	0.9 million
Other Water-Related Activities (River Trips)	331,000	20.27	6.7 million
Hunting	216,000	35.18	7.6 million
Winter Activities	14,600	13.98	0.2 million
Totals	2,204,500		\$35.1 million

Source: Richard G. Walsh and John Loomis, December 1986, The Contribution of Recreation to National Economic Development; Utah BLM File Data.

Historically, the economy of most of the 14 counties listed in Table 78 has been highly dependent on resource-related industries such as agriculture, mining, and construction; and they have been less dependent on manufacturing, trade, services, and finance. These affected counties generally have a proportionally high dependence on government employment. As shown in Table 78, many of the 14 counties currently are experiencing economic stagnation (shrinking labor force, high unemployment, and outmigration), typical of similar situations in the western United States where resource commodity production traditionally has been dominant. As a percentage of the Statewide Utah economy, agriculture, mining, and government employment are declining, whereas trade and service industries are projected to continue to increase (Utah Office of Planning and Budget, 1987).

Commodity Production and Employment in WSAs

Current commodity production within most of the WSAs is relatively low. Table 79 indicates the current production and economic contribution of the WSAs attributed to minerals, forestry, and livestock grazing. These activities account for a minor proportion of income from BLM-administered land and all land within Utah. Similarly, the existing employment directly generated by commodity production activities within the WSAs is insignificant at both the State

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Table 78
Selected Economic Statistics for Counties with WSAs

Affected Counties	County Acreage In WSAs (Percent)	Net Migration As A Percent of Population 1980 to 1987		Unemployment Rate 1987 (Percent)	Labor Force Growth 1980 to 1987 (Percent)
		Annual Average (Percent)	7-Year Change (Percent)		
Beaver	0.4	0.0	0.0	0.0	0.0
Carbon	9.2	-1.9	-13.4	10.2	-14.6
Emery	15.7	-2.0	-14.2	14.9	-34.8
Garfield	15.8	-0.4	-2.8	12.3	-31.4
Grand	14.7	-3.6	-25.3	10.4	-29.5
Iron	0.2	0.0	0.0	0.0	0.0
Juab	4.2	-1.6	-10.9	15.5	-13.7
Kane	24.4	+0.7	+5.2	7.6	+50.3
Millard	6.2	+4.5	+31.8	7.5	+57.4
San Juan	7.7	-2.4	-16.5	8.5	-12.3
Tooele	2.2	0.0	0.0	7.5	-2.2
Uintah	1.6	-1.0	-7.3	11.7	-2.3
Washington	5.7	+5.6	+39.5	5.5	+64.4
Wayne	12.0	-0.7	-5.2	10.0	+11.6
Total State	6.2	+0.0	+0.3	6.5	+13.3

Source: Utah Department of Employment Security, 1987; BLM Records, 1985.

and local levels; however, in some areas, the employment and income from activities within a WSA may be significant to an individual directly using the resource. The potential for increased or new commodity production within WSAs, including related economic and employment factors, is addressed in Chapter 4 of this volume.

Sales and Revenues

The main economic-related activities in the WSAs include livestock production, mineral activities, and recreation.

Three hundred and thirty-nine livestock operators have grazing privileges in the WSAs. Based on the consumption of an estimated 95,345 AUMs of forage by livestock, it is projected that the WSAs account for \$1,906,900 of livestock sales, including \$476,725 of ranchers' returns to labor and investment. These expenditures would be significant to local ranchers, however, they are of low significance to the local and regional boundaries.

Gas production and exploration in three WSAs has brought some income to local economies. There are about 5,327 mining claims in the BLM WSAs. Regula-

tions require a \$100 per claim annual expenditure for labor and improvements. Some of these expenditures are made within the local economies.

Recreation in most WSAs is low and related local expenditures are well distributed and locally insignificant. Two WSAs (Westwater and Desolation Canyons) support significant private and commercial boating use, and resulting recreation use contributes about \$1,500,000 and \$1,152,000 respectively to the local economies. The total current local sales related to recreational use of the WSAs in Utah is about \$3,387,467 annually.

Revenues such as rental fees, use fees, and grazing fees are attributed to several current activities within the WSAs. Federal revenues generated from all BLM-administered land in Utah and from lands within the WSAs are shown in Table 80. Fees for oil and gas leases are varied, and fees per AUM for livestock grazing changes from year to year. This EIS uses representative values of \$2 per acre (plus estimated royalties, where applicable) for oil and gas leases and the 1987 rate of \$1.54 for livestock grazing (see Appendix 9).

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The Federal share of the revenues generally are deposited in the U.S. Treasury and subsequently used for general budgetary purposes. Except for on-shore minerals, Federal management costs associated with these activities usually equal or exceed the revenues collected. Also, other Federal costs are associated with various non-revenue producing land management programs. For some programs, Federal revenues are shared with the State.

The WSAs generate revenues to the Federal Treasury from three main sources (grazing fees, mineral leasing and royalties, and recreation permitting).

Based upon 93,345 AUMs of forage consumed by livestock in the WSAs and a grazing fee of \$1.54, the WSAs annually account for about \$146,831 of grazing fee revenues to the Treasury. Half of this is allocated back to the local BLM District for the construction of range projects in the region.

Oil and gas and other lease rental fees and royalty payments contribute approximately \$1,019,894 annually to the Federal Treasury. Half of all Federal mineral revenues collected in Utah are allocated to the State. The State then reallocates these revenues to various funds, the majority of which are related to energy development.

Fees charged for commercial and private recreational use within the WSAs currently generates about \$96,442 of Federal revenues annually.

The Federal lands within WSAs that may be designated as wilderness do not provide significant revenues used to support the public schools in Utah. The State sections within WSAs do provide a very small percentage of the State school fund (but may not represent a net gain to the total State budget, as noted below). Of the 3,591,219.23 acres of State school lands, 183,148 acres (5.1 percent) are located within WSAs. The State sections within WSAs would either (1) remain under State management with reasonable access allowed; or (2) be exchanged for public land of equal value elsewhere in the region, so there would be no loss to the school fund.

As noted in the State lands information in Chapter 1, improved land management may be attained by trading scattered in-held State sections for tracts in larger blocks, regardless of wilderness considerations. For example, with the scattered State land sections, "lease revenues have rarely, if ever exceeded the costs incurred by the State to manage the school

lands. In 1986, the lands produced between \$0.8 and \$1.2 million in lease revenue. Management costs were \$1.2 million. Incredibly, the citizens of Utah received no [net] monetary return from the 3.7 million acres of surface (State school) lands" (Davis County Clipper, 1987).

Social Conditions

The three major factors affecting social conditions are: (1) the existing patterns of human use within the WSAs, (2) the public and individual perceptions concerning wilderness, and (3) attitudes of individuals, groups, and elected officials.

• Use Patterns

Current use of most WSAs is limited; in some cases alternative locations may be available, and relatively few people depend on these uses to maintain their existing lifestyles. Generally, the existing users are 339 permittees (ranchers) whose livestock are placed on the public lands during prescribed periods as part of a private ranch operation, 173 mineral lessees who have coal, oil and gas, or other extraction rights granted in the past (no leasing now occurs in WSAs), about 200 mining claim holders (who may or may not have a "valid" claim), and up to about 250,300 recreation visitors (including hunters, hikers, and OHV riders on existing ways). (Refer to the individual WSA analyses, Volumes II through VI, for additional information on these users.) The total number of users (251,012) is an over-estimation due to an unknown number of repeat recreation visitors. Although the total number of existing WSA users is relatively small (less than 16 percent of the Utah population), many of the users appear to have strong social beliefs pertaining to their particular, individual use and to their relationship to others. Where the uses conflict, the situation is not taken lightly within the individual, local, and Statewide social fabric. Further it is estimated that 20 to 30 percent of the users are from outside Utah. Social conflict over public land uses is inherent to some extent, but appears to be increasing.

• Perceptions

Varied individual and group perceptions concerning wilderness have generated a polarized debate. Although few people actually depend on a specific WSA to maintain their current lifestyle, public concerns about the impacts of wilderness designation or nondesignation are high. Perceptions opposing wilderness are

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Table 79
1987 Resource Production and Employment Estimates

Source	Output Units	Utah Totals		BLM Lands in Utah		WSAs in Utah	
		Output	Employment	Output	Employment	Output	Employment
Minerals							
Oil	1,000 barrels	35,800	1,700	6,516	340	10	2
Gas	Million CF	87,000	200	28,449	50	2,912.5	10
Coal	1,000 short tons	16,521	2,577	13,707	2,000	0	0
Geothermal	Million Btu's	190,000	20	189	18	0	0
Hydroelectric	Million KWH	1,394	N/A	N/A	N/A	0	0
Potash	Short tons	90,000	81	17,000	N/A	0	0
Molybdenum	1,000 lb	5,013	N/A	N/A	N/A	0	0
Copper	Metric tons	145,124	1,571	N/A	N/A	0	0
Gold	Troy oz	315,920	259	N/A	N/A	0	0
Silver	1,000 troy oz	4,062	191	N/A	N/A	0	0
Magnerium Oxide	Short tons	22,000	50	N/A	N/A	0	0
Uranium	1,000 lb U ₃ O ₈	5,320	344	N/A	N/A	0	0
Sand & Gravel	1,000 short tons	13,600	191	3,000	15	0	0
Stone	1,000 short tons	5,900	59	1,000	6	0	0
Selenium	lb	100,000	N/A	N/A	N/A	0	0
Iron	Short tons	119,000	35	N/A	N/A	0	0
Cement	1,000 short tons	1,100	100	N/A	N/A	0	0
Salt	1,000 short tons	1,100	50	N/A	N/A	0	0
Phosphate	1,000 short tons	883	149	N/A	N/A	0	0
Limestone	1,000 short tons	318	50	N/A	N/A	0	0
Gypsum	1,000 short tons	473	12	N/A	N/A	0	0
Clay	1,000 short tons	306	22	N/A	N/A	0	0
Berylium	1,000 short tons	7	20	N/A	N/A	0	0
Lead	Metric tons	N/A	N/A	N/A	N/A	0	0
Zinc	lb	N/A	N/A	N/A	N/A	0	0
Aragonite	- -	N/A	N/A	N/A	N/A	0	0
Tungsten	lb	N/A	N/A	N/A	N/A	0	0
Forestry							
Timber	MBF	60,456 ^a	N/A	0	0	0	0
Firewood	Cords	163,184 ^a	N/A	10,937	20	800	0
Christmas trees	Number	44,230 ^a	N/A	10,760	10	100	0
Posts and poles	Number	138,920 ^a	N/A	31,625	0	200	0
Livestock							
Cattle	AUM	7,920,000	4,197	943,736	500	72,240	38
Sheep	AUM	1,104,000	585	1,096,565	581	23,105	12
Operators	Number	- -	10,800	- -	1,770	- -	339
Hired Labor	Number	- -	- -	- -	- -	- -	- -

N/A = data not available.

^aProduction from private lands not included in total.

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Table 80
1987 Federal Revenues and Payments to Utah

Revenue Source	Total Federal Receipts From all BLM Lands in Utah and Payments to the State		Federal Receipts From WSAs and Payments to the State	
	Receipts (dollars)	Payments (dollars)	Receipts (dollars)	Payments (dollars)
Minerals	43,941,401	21,970,700	1,019,894	509,947
Forestry	58,906	0	1,150	0
Land and Materials	277,343	13,312	0	0
Grazing	1,325,996	165,749	146,834	18,354
Fees and Commissions	140,519	0	0	0
Rights of Way	124,626	0	0	0
Land Rental	6,263	0	0	0
Recreation	195,050	0	56,478	0
Other Sources	227,009	0	0	0
Payments in lieu of taxes		9,896,722		
Total	46,297,104	32,046,483	1,224,353	528,301

Source: BLM, Facts and Figures, 1987, 1988; BLM File Data.

Note: Payments to the State are based on prior fiscal year receipts.

influenced by Utah's traditionally strong emphasis on commodity-related economic growth, resource development and extraction, commodity production from land-based materials, and local government control (Centaur Associates, 1979). These traditional values are more strongly apparent in rural Utah than in the more diverse populations along the urbanized Wasatch Front. The high proportion of Federal lands relative to private land in rural Utah has constrained and apparently frustrated local control of resource use, and wilderness designation is often viewed as a further imposition on local use options. Regional and local misconceptions about the Wilderness Act and wilderness management policies have added to the anti-wilderness perceptions. This also, in some cases, has been fostered by unrealistically optimistic expectations regarding the likelihood of future mineral and energy development or other alternative nonwilderness uses.

On the other hand, misconceptions affecting certain pro-wilderness perceptions tend to oversimplify wilderness designation as a panacea for many land management concerns, and overlook the opportunities for protection of scenic, cultural, wildlife, or other values by a variety of management techniques not requiring formal designation of wilderness.

The public comment responses on the Draft EIS illustrate that views and perceptions of both anti- and pro-wilderness interests are strongly held, and that there seems to be few people actively taking a middle

ground on the issue. It is apparent that Utah's presently wild and undeveloped public lands are important to both rural and urban residents, as a component for the lifestyle desired (but differently defined) by many people in Utah and by visitors.

• Attitudes

Various studies have attempted to clarify public attitudes and socioeconomic implications of wilderness; however, many complex variables exist. In other states, some counties with (or adjacent to) designated wilderness have grown in population; however, no single factor dominated the in-migrants' decision to move, although many people were influenced by the attributes of the wilderness counties (Rudzitis, 1989). It has been indicated that amenity values (such as option value, existence value, and bequest value) are important to some people (Walsh, et al., 1982).

In Utah, several surveys or other actions have resulted in findings with varied interpretation. Several conclusions reached are:

1. The majority of Utah residents favors some designated wilderness areas (Bauman, 1982).
2. Generally, negative attitudes toward wilderness are most prevalent in southern Utah, whereas support for wilderness is most prevalent in western

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Utah and the urbanized Wasatch Front (Edmonds and DePaepe, 1982).

3. Although some of their traditional land uses are incompatible with designated wilderness management, the native American generally is oriented towards respect for and preservation of natural values (Duncan, 1983; and Edmonds and DePaepe, 1982).

4. Wilderness designation enhances the image of Utah as a tourism State, 81.7 percent of respondents agree or strongly agree (UofU, 1986).

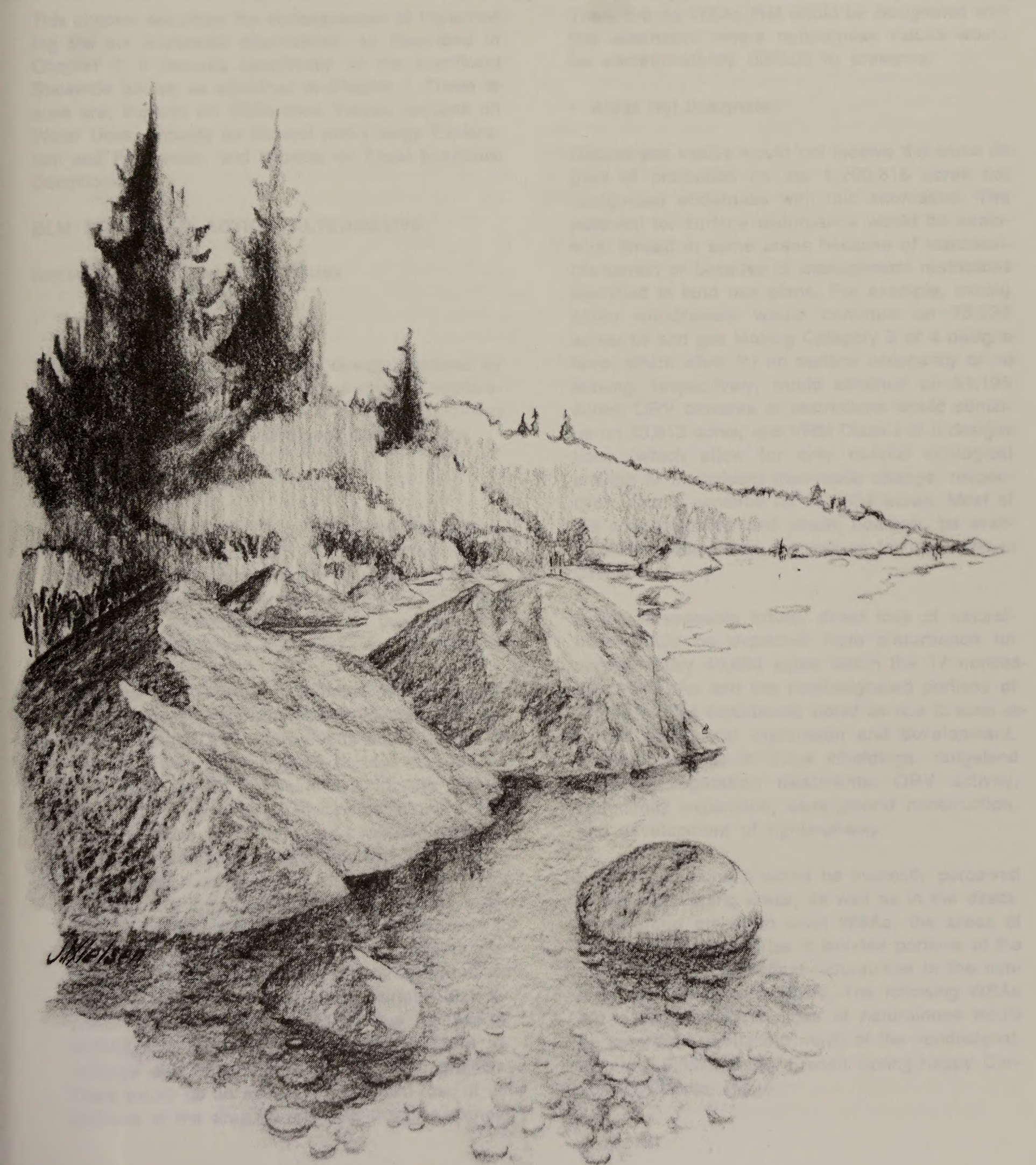
5. The Federal Government has designated enough official wilderness areas in Utah, 46.3 percent of respondents agree or strongly agree, 33.9 percent disagree or strongly disagree, and 18.2 percent are neutral (UofU, 1986).

6. Utah State legislators expressed opposition to the designation of any further wilderness in Utah, urged Congress to amend FLMPA to exclude states with more than 30 percent Federal ownership (applicable to Utah) from the provisions of the Wilderness Act, and urged the State Land Board not to trade any State sections out of BLM wilderness study areas (Utah State Legislature, 1986).

7. Wilderness designation in Utah appears to have broad-based support among Utah residents, 86 percent of respondents agree that wilderness is important or very important (BYU, 1987).

In particular, the extreme variance in perceptions and attitudes makes the wilderness review process difficult, defeats reasonable expectations for amiable consensus regarding areas to be designated, and sets the stage for continued social conflict in the future.

Environmental Consequences of Alternatives



CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the consequences of implementing the six Statewide alternatives, as described in Chapter 2. It focuses specifically on the significant Statewide issues, as explained in Chapter 1. These issues are: Impacts on Wilderness Values, Impacts on Water Uses, Impacts on Mineral and Energy Exploration and Production, and Impacts on Local Economic Conditions.

BLM PROPOSED ACTION ALTERNATIVE

Impacts on Wilderness Values

- Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

- Areas Designated

Wilderness designation of all of 30 WSAs and parts of 36 WSAs (1,975,219 total acres) included in this alternative would protect naturalness values on about 61 percent of the acreage in the 83 WSAs. All designated acres in this alternative meet the Wilderness Act criteria for naturalness.

With this alternative, management of the designated areas according to the BLM Wilderness Management Policy (BLM Manual 8560) would largely remove the potential for future surface disturbance that would reduce naturalness. Complete preservation of naturalness is anticipated in the designated portions of 26 of the 66 WSAs. Although protected, complete preservation of naturalness in the designated portions of the remaining 40 WSAs is not anticipated, largely due to the existence of valid existing rights. In the foreseeable future, naturalness values in the designated portions of these WSAs would be directly lost on approximately 564 acres due to surface disturbance. The disturbance would be due to mineral-related activities, providing access to State inholdings and development of rangeland projects. There would be an additional perceived loss of naturalness in the area surrounding the disturbance.

However, naturalness values would be preserved in the designated area as a whole in all cases. There are no WSAs that would be designated with this alternative where naturalness values would be administratively difficult to preserve.

- Areas Not Designated

Naturalness values would not receive the same degree of protection on the 1,260,615 acres not designated wilderness with this alternative. The potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in land use plans. For example, mining claim withdrawals would continue on 73,336 acres; oil and gas leasing Category 3 or 4 designations, which allow for no surface occupancy or no leasing, respectively, would continue on 54,195 acres; ORV closures or restrictions would continue on 53,613 acres; and VRM Class I or II designations, which allow for only natural ecological change or nonevident man-made change, respectively, would continue on 355,834 acres. Most of the nondesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, direct loss of naturalness would be expected from disturbance on approximately 40,684 acres within the 17 nondesignated WSAs and the nondesignated portions of 37 WSAs. The disturbance would be due to such activities as mineral exploration and development, providing access to State inholdings, rangeland projects, vegetation treatments, ORV activity, community expansion, campground construction, and development of rights-of-way.

Loss of naturalness would be indirectly perceived in the surrounding areas, as well as in the directly disturbed areas. In most WSAs, the areas of perceived loss would be in isolated portions of the unit and would not affect naturalness in the nondesignated area as a whole. The following WSAs are exceptions where loss of naturalness would be perceived throughout much of the nondesignated area: Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge.

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The projected loss of naturalness in the nondesignated areas is not only based on resource values, but also on the continuation of present management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of naturalness greater than projected here.

Conclusion: Naturalness values would be preserved overall in the designated areas, which comprise about 61 percent of the total acreage in the 83 WSAs. Naturalness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 41,248 acres. About 99 percent of the loss would be in nondesignated areas.

- Solitude

In general, opportunities for solitude would be directly lost by the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. Opportunities would also be indirectly reduced in quality by such impacts as noise and dust that would occur during the period of development and by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of 30 WSAs and parts of 36 WSAs (1,975,219 total acres) included in this alternative would protect the solitude values in about 61 percent of the acreage in the 83 WSAs. Approximately 1,787,074 of the designated acres in this alternative have outstanding opportunities for solitude and 188,145 acres do not.

With this alternative, the potential for development and vehicular activity that would impair solitude would be eliminated or largely reduced in the designated areas. Complete preservation of solitude is anticipated in the designated portions of 26 of the 66 WSAs. Although protected, complete preservation of solitude in the designated portions of the remaining 40 WSAs is not anticipated, due to the same reasons identified in the analysis for naturalness. In the foreseeable future, solitude values in the designated portions of these WSAs would be directly lost on approximately

564 acres and indirectly reduced in quality on up to an additional 84,547 acres. There are no WSAs that would be designated with this alternative where opportunities for solitude would be administratively difficult to preserve.

Increases in visitor use over time would be diffused throughout the WSAs, would be primitive in nature, and generally would have little effect on opportunities for solitude. In some smaller WSAs, in WSAs comprised of narrow canyons, and in popular areas where increases would reduce the quality of solitude, wilderness management plans would identify and require the use of such techniques as use scheduling, to preserve solitude. The following WSAs may be affected in this way: Parunuweap Canyon, Phipps-Death Hollow, Grand Gulch, Fish Creek Canyon, Mule Canyon, Behind the Rocks, Mill Creek Canyon, and Negro Bill Canyon.

- Areas Not Designated

Solitude would not receive the same degree of protection on the 1,260,615 acres not designated wilderness with this alternative. Most of the nondesignated land would be available for development, as well as for increases in ORV use. In the foreseeable future, loss of solitude resulting directly from surface disturbance would be expected on approximately 40,684 acres within the 17 nondesignated WSAs and the nondesignated portions of 37 WSAs. Indirect reduction in the quality of solitude, although generally temporary, would involve as many as 381,400 additional acres in the nondesignated areas.

The WSAs where potential disturbance would directly or indirectly affect solitude on more than 20 percent of the WSA include the following: Deep Creek Mountains, Rockwell, Swasey Mountains, Moquith Mountain, Wahweap, Fifty Mile Mountain, French Spring-Happy Canyon, Fiddler Butte, Devils Canyon, Jack Canyon, Coal Canyon, and Winter Ridge.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce the quality of opportunities for solitude, particularly where increased use would be largely vehicular in nature. The WSAs where increased visitor use in the nondesignated area would affect opportunities for solitude are: Cedar Mountains, Moquith

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Mountain, Paria-Hackberry, The Cockscomb, Devil's Canyon, Cheesebox Canyon, Sids Mountain, Mexican Mountain, and Fish Creek Canyon.

As with naturalness, the projected loss of solitude in the nondesignated areas is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of solitude greater than projected here.

Conclusion: Opportunities for solitude would be preserved overall in the designated areas, which comprise approximately 61 percent of the total acreage in the 83 WSAs. Opportunities for solitude would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, a direct loss of solitude would occur on about 41,248 acres, and an indirect reduction in the quality of solitude would occur on up to an additional 465,947 acres. About 99 percent of the loss would be in nondesignated areas.

• Primitive and Unconfined Recreation

As with solitude, opportunities for primitive and unconfined recreation would be directly lost by mineral exploration and development, road and other rights-of-way development, development projects, and vehicle use. Opportunities for primitive and unconfined recreation would also be indirectly reduced in quality by dust and noise that would occur in the surrounding area during the period of disturbance, and by increases in visitor use, particularly use involving vehicular activity.

• Areas Designated

Wilderness designation of all of 30 WSAs and parts of 36 WSAs (1,975,219 total acres) included in this alternative would protect the primitive and unconfined recreation values in about 61 percent of the acreage in the 83 WSAs. In this alternative, 1,716,263 acres of the designated acres in 65 WSAs have outstanding opportunities for primitive and unconfined recreation, and 258,956 acres do not. One of the designated areas, Howell Peak, does not have any outstanding opportunities for primitive and unconfined recreation.

With this alternative, the potential for disturbance and vehicular activity that would impair opportunities for primitive and unconfined recreation would be eliminated or largely reduced in the designated areas. Still, in the foreseeable future, a direct loss of opportunities for primitive recreation would result from approximately 564 acres of surface disturbance in the designated portions of 40 of the 66 WSAs. An indirect reduction in the quality of opportunities for primitive recreation would occur on an additional 84,547 acres. However, opportunities for primitive and unconfined recreation would be preserved in the designated areas as a whole. There are no WSAs that would be designated with this alternative where opportunities for primitive recreation would be administratively difficult to preserve.

Increases in primitive-type visitor use over time generally would have little effect on opportunities for primitive and unconfined recreation; however, some visitors may perceive the quality of the wilderness recreation experience to be adversely affected in those areas where concentrations of visitors may occur. The WSAs where wilderness management plans would identify and require techniques to control use in such instances are the same as identified in the analysis for solitude.

• Areas Not Designated

Primitive and unconfined recreation values would not receive the same degree of protection on the 1,260,615 acres not designated wilderness with this alternative. Most of the nondesignated areas would be available for development, as well as for increases in ORV use. In the foreseeable future, approximately 40,684 acres of surface disturbance in the nondesignated areas would result in direct loss of opportunities for primitive and unconfined recreation. There would be an additional indirect reduction in the quality of opportunities on 381,900 acres in the nondesignated areas.

The WSAs where potential disturbance would either directly or indirectly affect primitive recreation opportunities on more than 20 percent of the WSA are the same as identified for solitude.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce primitive

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recreation opportunities, particularly where increased use would be largely vehicular in nature. The WSAs where such use would significantly reduce the quality of opportunities for primitive recreation are the same as identified for solitude.

The projected loss of opportunities for primitive and unconfined recreation in the nondesignated area is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of opportunities for primitive and unconfined recreation greater than projected here.

Conclusion: Opportunities for primitive and unconfined recreation would be preserved overall in the designated areas, which comprise approximately 61 percent of the total acreage in the 83 WSAs. Primitive recreation opportunities would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness type uses increase. In the foreseeable future, a direct loss of primitive recreation opportunities would occur on about 41,248 acres, and an indirect reduction in the quality of these opportunities would occur on up to an additional 465,947 acres. About 99 percent of the loss would be in nondesignated areas.

• Special Features

Impacts on special features primarily are caused by surface disturbance, and by noise and vandalism which are related to ease or lack of access and the amount of visitation. Generally, special features are more difficult to manage in areas with disturbance, easy access, and high use than in undisturbed, remote areas.

• Areas Designated

Wilderness designation of all of 30 WSAs and parts of 36 WSAs (1,975,219 total acres) would contribute to the preservation of special features which are found in these WSAs. The potential for surface disturbance, vehicular activity, and other actions that would harm special features would be eliminated or largely reduced in the designated areas. The approximately 564 acres of surface disturbance projected to occur in the designated areas in the foreseeable future would directly impact much less than 1 percent of the

designated acreage and would be managed to minimize the effect on special features.

With this alternative, the distribution of special features found in the 66 WSAs that would be designated are as follows: 66 WSAs have scenic features, 39 WSAs have archaeological or historical features (cultural sites), 66 WSAs have ecological features, 66 WSAs have geological features, and 34 WSAs have other special features which include wild horses and/or perennial waters. Approximately 1,654 of 2,246 known cultural sites in the WSAs would be in the designated areas. Of the known cultural sites, 89 are on the National Register (all of which would be in designated areas) and approximately 898 are eligible for the National Register, (848 of which would be in designated areas).

A total of 1,469,333 acres of Class A scenery would be protected by wilderness designation. This is approximately 83 percent of the high quality scenery within the 83 WSAs, approximately 43 percent of the high quality scenery on BLM lands in Utah, and an estimated 15 percent of the high quality scenery in the State.

Fifteen WSAs have wild and scenic inventory rivers flowing through them. Fourteen of these WSAs would be designated at least in part, and the rivers primarily would be within the designated areas. Wild and scenic inventory rivers would be protected by wilderness designation, but this would not preclude further consideration for designation under the Wild and Scenic Rivers Act. Rivers in six of the 14 WSAs that would be designated with this alternative (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Sids Mountain, and Mexican Mountain) could have water flow influenced by upstream water uses (see the Impacts on Water Uses section). These six rivers would be protected not only by the fact that allowable surface disturbance would be minimal, but also because upstream projects, that would require Federal permitting and that would affect water flow through the wilderness probably would not receive approval. The amount of water in inventory rivers flowing through the other eight WSAs that would be designated (Deep Creek Mountains, LaVerkin Creek, Steep Creek, Paria-Hackberry, Deep Creek, Grand Gulch, Desolation Canyon, and Westwater) probably would not change much, even without

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wilderness designation. This is because headwaters or intermittent streams are involved with minimal potential for development, because of downstream National Park water needs, because of downstream user needs, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

Increases in primitive-type visitor use over time generally would be diffused and would have little effect on special features.

• Areas Not Designated

Special features would not receive the same degree of protection on the 1,260,615 acres not designated wilderness with this alternative. The special features in the 17 WSAs not designated are as follows: 11 WSAs have scenic features, 10 WSAs have historical features, 17 WSAs have ecological features, 14 WSAs have geological features, and 10 WSAs have other special features.

The potential for inadvertent damage would be greater in nondesignated areas than in the wilderness. Most of the undesignated land would be available for development, as well as for increases in ORV use that could disturb special features. In the foreseeable future, projected disturbance of approximately 40,684 acres could affect special features. Some special features (e.g., archaeological values and threatened, endangered, or candidate plants and animals) would continue to be protected by separate laws and policies. However, other special features (e.g., unusual plant or animal communities, geological features, or scenic values) could be lost or reduced in quality by development or ORV use. Unless designated as a wild and scenic river in the future, the inventory river in the nondesignated portion of one WSA, Cheesebox Canyon, would not be given Congressional protection. However, because the stream in Cheesebox Canyon is intermittent with limited development potential, it is highly unlikely that there would be projects in the future that would affect it.

Increases in visitor use over time would have little affect on special features in most WSAs. The opportunity for increased ORV use to result in increased cultural resource vandalism would be greatest in Cheesebox Canyon and Fish Creek Canyon.

Conclusion: Special features would be preserved overall in the designated areas which comprise approximately 61 percent of the total acreage in the 83 WSAs. Special features would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness uses increase. Approximately 80 percent of the wilderness special features found in the 83 WSAs would be protected by wilderness designation with this alternative.

Impacts on Water Uses

The BLM Proposed Action Alternative would designate 66 areas, with 36 of these areas containing a total of 632.5 miles of perennial streams. Nonconsumptive and natural water uses such as watershed, riparian areas, recreation, aesthetics, and wildlife would be favored within the wilderness areas. About 86.5 miles of the 719 miles of perennial streams in WSAs would be in areas not designated as wilderness and would be open to future diversions and water consumptive developments.

Water use considerations in 31 of the 66 WSAs or portions of WSAs that would be designated wilderness would not be affected because they lack perennial streams. In addition, existing water uses would not be significantly affected within the designated WSAs because maintenance of existing facilities would be allowed. Most small, new water developments such as proposed catchments, guzzlers, spring developments etc., could be designed and installed consistent with wilderness protection guidelines.

Overall, 22 proposed livestock reservoirs would be precluded, but this would not have a significant affect on livestock grazing on a Statewide basis. The BLM Proposed Action Alternative would preclude potential future municipal water project for the town of Kanarville in the Spring Creek Canyon WSA.

Designation of wilderness could complicate future proposals or projects that would transfer location points of water diversion, consumptively use water upstream of WSAs, or otherwise significantly alter flow through 28 designated nonheadwater WSAs with perennial streams, listed in Table 81. Such projects would be hampered because changes in use and changes in points of diversion could be protested by the Federal government to maintain the existing water use patterns which support public values (such as riparian areas and wildlife) and which now allow

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instream flow. Although such protests can (and sometimes do) occur without wilderness designation, they would be more likely with wilderness designation. The State Engineer could choose to accept or reject the protest, but the overall effect could be delay or increased uncertainty in project approvals. In addition, the Federal government could deny necessary rights-of-way or other approvals for projects that would alter water flow through designated wilderness.

Table 81

Proposed Action Designated Non-Headwater WSAs With Perennial Streams	
Deep Creek Mountains	Dark Canyon
Cougar Canyon	Indian Creek
Deep Creek Canyon	Mill Creek
North Fork Virgin River	Negro Bill Canyon
Parunuweap Canyon	Horseshoe Canyon (North)
Paria-Hackberry	Crack Canyon
Phipps-Death Hollow	Muddy Creek
Steep Creek	Sids Mountain
North Escalante/The Gulch	Mexican Mountain
Scorpion	Desolation Canyon
Dirty Devil	Turtle Canyon
Fiddler Butte	Floy Canyon
Little Rockies	Westwater Canyon
Fish Creek Canyon	Spring Creek Canyon

Source: WSA Analysis

Of the 28 designated nonheadwater areas with perennial streams, seven (Deep Creek Canyon, North Fork Virgin River, Parunuweap Canyon, Horseshoe Canyon [North], Desolation Canyon, Westwater and Spring Creek Canyon) are on the Virgin, Green or Colorado Rivers upstream of the Zion or Canyonlands National Parks. Wilderness would not add appreciably to existing constraints on development of these rivers which include releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the lower Colorado River Basin states, and consideration of water needs for endangered fish species.

Fourteen of the 28 nonheadwater WSAs with perennial streams (Deep Creek Mountains, Cougar Canyon, Paria-Hackberry, Phipps-Death Hollow, Steep Creek, Scorpion, Little Rockies, Fish Creek Canyon, Dark Canyon, Indian Creek, Mill Creek, Negro Bill Canyon, Turtle Canyon, and Floy Canyon) have perennial streams that originate only a short distance above the WSA or are part of small drainages without the potential for major water projects upstream of the WSA.

Therefore, few impacts, if any, on upstream uses would result from designation of these areas.

Eight designated areas (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Muddy Creek, Sids Mountain, Mexican Mountain, and Desolation Canyon [Price River]) have perennial streams that originate long distances above the WSAs and flow through areas where major water projects and diversions now occur or are likely in the foreseeable future. The affected drainages would be the Escalante River, Muddy Creek and Dirty Devil, the San Rafael River, and the Price River. Wilderness-related water considerations for these streams would be placed on new projects that would divert and use water for coal mining and coal-fired electrical power generation in the Garfield, Emery, and Carbon counties; expansion of irrigation and reservoirs in the Sevier, Wayne, Emery and Carbon counties; and tar sand development in the Wayne and Garfield counties or on other possible new water consumptive projects.

Conclusion: Nonconsumptive use of water for wilderness purposes would be favored in 35 areas with perennial streams. Development of a proposed municipal water source would be precluded in one wilderness area. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 58 of the 66 areas that would be designated with the BLM Proposed Action Alternative. The BLM Proposed Action Alternative could complicate future water diversion and use upstream from eight designated areas in Sevier, Wayne, Garfield, Emery, and Carbon Counties.

Impacts on Mineral and Energy Exploration and Production

Implementation of the BLM Proposed Action Alternative would place maximum limitations on potential mineral and energy resource development on 1,975,219 acres in all of 30 and portions of 36 WSAs designated as wilderness as discussed in the All Wilderness Alternative. The remaining 1,260,615 acres in 17 WSAs and portions of 36 other WSAs would remain open to mineral and energy development subject to BLM land management plan guidance as discussed in the No Action/No Wilderness Alternative.

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- Leasable Mineral Production

- Areas Designated

In the areas designated as wilderness, all 1,975,219 acres would be closed to oil and gas leasing. However, existing pre-FLPMA oil and gas leases on 22,381 acres located within the designated portions of seven WSAs (North Escalante Canyons/The Gulch, Phipps-Death Hollow, French Spring-Happy Canyon, Fiddler Butte, Desolation Canyon, Coal Canyon, and Flume Canyon) could be explored and developed per stipulations attached at the time of lease issuance. BLM projects that development would occur in only four of these WSAs (Phipps-Death Hollow, Desolation Canyon, Coal Canyon, and Flume Canyon). These are the WSAs with the highest potential for oil and gas exploration and development. That portion of the carbon dioxide resource under pre-FLPMA lease in the Phipps-Death Hollow WSA also could be developed.

Exploration and development of existing post-FLPMA leases on 144,838 acres in 33 WSAs could also occur subject to nonimpairment provisions. However, BLM projects that these leases would expire without any exploration or development activities occurring. Because the remaining 1,808,000 acres in the designated wilderness areas would be closed to leasing, no oil and gas exploration or development would occur in these areas. An undetermined amount of oil and gas could be extracted from designated areas by drilling activities adjacent to designated wilderness boundaries.

The designated portions of the North Escalante Canyons/The Gulch, French Spring-Happy Canyon, and Fiddler Butte WSAs contain approximately 18,820 acres of pre-FLPMA oil and gas leases which are under application for conversion to combined hydrocarbon leases. Portions of these WSAs are located within the Circle Cliffs, Tar Sand Triangle, and P.R. Spring STSAs. Conversion of existing leases to combined hydrocarbon leases would be necessary before tar sand development could occur. However, once conversion occurred, these leases would become post-FLPMA leases and, therefore, subject to wilderness nonimpairment standards. Because it would be very difficult for tar sand development to meet the nonimpairment requirements, it is projected that the leases un-

der combined hydrocarbon lease conversion application would not be developed. No new competitive leasing for tar sand in the designated portions of the WSAs would be allowed. Overall, about 50 million barrels of in-place tar sand resource would be foregone. Since this would be less than 1 percent of the total estimated 28 billion barrels of in-place tar sand resources in Utah, it would not be significant in the long-term future. It is noted, however, that development of the tar sand resource would be dependent on improved future technologies. Therefore, wilderness designation would not, at present, be the only limitation on full extraction of the tar sand resource.

No Coal leases or PRLAs are located within the designated portions of the WSAs. New coal leasing would not be allowed once wilderness designation occurred. Portions of four WSAs (Fifty Mile Mountain, Mt. Ellen-Blue Hills, Desolation Canyon, Turtle Canyon) that have coal development possibilities would be designated wilderness. The coal resource within these areas would be foregone once designation occurs. However, the majority of the coal resource found in the WSAs is located in the nondesignated areas with this alternative. Therefore, a significant amount of in-place resource would not be foregone.

- Areas Not Designated

In the 1,260,615-acre nondesignated area, approximately 1,246,357 acres would remain open to oil and gas leasing as discussed in the No Action/ No Wilderness Alternative. Approximately 14,258 acres would remain closed to oil and gas leasing. Production of natural gas would continue to occur in the Jack Canyon, Desolation Canyon, and Winter Ridge WSAs. In addition, oil and gas exploration and possibly development is projected for the nondesignated portions of Turtle Canyon, Floy Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon WSAs.

BLM projects that exploration and eventual development of the coal resource would occur in six WSAs (not designated wilderness) and the nondesignated portions of four other WSAs. Exploration and development would occur as discussed in the No Action/No Wilderness Alternative. The majority of development would occur on the Kaiparowits Plateau. Lesser amounts of coal would also

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be produced from the nondesignated portions of the Mt. Ellen-Blue Hills, Turtle Canyon, and Desolation Canyon WSAs.

No development of the oil shale resource, potash, phosphate, or any other leasable minerals are projected to occur in either the designated or nondesignated portions of any of the WSAs in the foreseeable future. No development of the geothermal or hydropower resource is projected. Therefore, significant amounts of these resources would not be foregone with implementation of the BLM Proposed Action.

Conclusion: With the Proposed Action, oil and gas resources projected to be developed in all or part of nine WSAs would be foregone with the exception of portions of four WSAs which contain 22,381 acres of pre-FLPMA leases. Development of the tar sand and coal resources would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. No development of any other leasable mineral or energy resources is projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

- Locatable Mineral Production

- Areas Designated

All 1,975,219 acres within the designated portions would be withdrawn from locatable mineral entry. However, development work, extraction, and patenting would be allowed to continue on 4,062 existing mining claims (81,240 acres) and any future mining claims located prior to wilderness designation. Not all of these claims would be developed. BLM projects that disseminated gold would be produced from the Swasey Mountains WSA. Copper and vein type silver and gold would be explored for and possibly developed from North Stansbury Mountains, Deep Creek Mountains, Mt. Pennell, Mt. Hillers, and Little Rockies WSAs. Uranium and vanadium production is projected for Mt. Hillers, Little Rockies, Bridger Jack Mesa, Horseshoe Canyon (North), San Rafael Reef, Crack Canyon, Muddy Creek, Sids Mountain, and Mexican Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to 9 additional WSAs (see Appendix 6).

Exploration and development activities would be restricted to valid mining claims existing at the time of designation. Any locatable minerals located within the designated wilderness areas, but not under valid mining claim, could not be developed and production of locally significant amounts of gold, silver, copper, uranium and vanadium would be foregone. However, based on existing data, loss of locatable minerals would not be significant on a Statewide or national basis. It is not projected that significant amounts of any other locatable minerals would be foregone with this alternative.

- Areas Not Designated

Locatable mineral exploration and development would be possible on 1,187,279 of the 1,260,615 acres not designated wilderness with this alternative. Approximately 73,336 acres would continue to remain closed to locatable mineral entry. No wilderness constraints would be placed on locatable minerals in these areas. Therefore, exploration and development in these areas would occur as discussed in the No Action/No Wilderness Alternative.

Conclusion: Exploration and/or development of mining claims would occur in 23 WSAs. Wilderness designation would limit activities to existing mining claims in 22 of the 23 WSAs. In designated areas locatable minerals would be foregone however, this would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

Impacts on Local Economic Conditions

The BLM Proposed Action Alternative includes 1,975,219 acres in WSAs where wilderness designation could affect economic development. There would be 1,260,615 acres in WSAs that would not be designated wilderness and where existing socio-economic factors would continue.

- Local Employment

With the Proposed Action Alternative, the predicted baseline for population and employment is expected (see Chapter 3). Any substantial increases in future employment attributed to activities in WSAs are expected to occur primarily in the Central, Southeast, and Southwest MCDs, mostly in those counties with

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sparse populations (see Figure 7). The total number of new jobs projected for this alternative would be substantially less than 5 percent of the Statewide total employment. While this existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8).

- Areas Designated

Existing employment (portions of less than 100 jobs) would continue; however, the potential for new development and new employment would be foregone for most minerals and new livestock activities that might otherwise occur in the designated areas. For the WSAs designated as wilderness, the only increases in employment would be new mineral activities allowed under prior existing rights and new commercial recreation activities. The 3 WSAs where most commercial recreation employment now occurs would be included as wilderness, and this use would continue however, new commercial opportunities would be limited as Desolation Canyon, Westwater Canyon and Grand Gulch are already at or near capacity.

Increased recreation use could occur, with additional employment attributed to commercial outfitters, in those WSAs that have potential for additional tourism related use, such as the North Escalante Canyon/The Gulch. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals.

Whatever the level of dispersed recreational use of a particular area, the associated socioeconomic impacts are likely to be relatively insignificant when viewed in the total regional context (Centaur, 1979).

- Areas Not Designated

With this alternative, the existing activities would continue within 17 WSAs and portions of 36 WSAs not designated. Employment related to activities in the nondesignated areas would continue as now exists and would increase similar to the projected baseline for the affected MCD.

In addition, the projected activities (as described in each specific WSA analysis) for all or parts of

the 53 areas not designated wilderness would occur. This would include mineral exploration, mineral development, increases in livestock grazing, additional commercial recreation, and in many locations, no new activities. These projected actions are estimated to result in a small increase in local employment within the foreseeable future. Most of these future jobs would be temporary within the WSAs and essentially all of the recreation jobs would be seasonal.

In the long term, WSAs with high hydrocarbon potential and not designated wilderness could lead to the creation of a locally significant number of jobs, if the technology and/or markets associated with coal and tar sand were to improve. In the long term, extraction of bitumen from tar sand in the Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge WSAs would increase employment in the eastern Emery, Wayne, and Uintah Counties. Likewise in the long term, production of large amounts of coal from the WSAs in the Kaiparowits region would increase employment in the Garfield and Kane counties. Continued extraction of oil and gas from the Winter Ridge, part of the Desolation Canyon, Jack Canyon, and portions of other WSAs in the Book Cliffs region would tend to stabilize and possibly increase related employment in the Uintah, eastern Emery, and northern Grand counties.

Increasing emphasis on tourism and related employment in Utah would continue and would involve recreation uses within some of the WSA areas not designated, such as Moquith Mountain and along cherry-stemmed roads at many WSAs.

Conclusion: Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant on a Statewide basis or to any MCD region as a whole. The long-term potential for future extraction of tar sand and Kaiparowits coal, could be significant to local communities, should it occur. The BLM proposed action alternative generally would accommodate the long-term potential for tar sand and coal development.

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- Local Sales

The BLM Proposed Action Alternative would continue the local sales patterns relative to existing activities within the WSAs.

Continuation of existing uses and limited increases in mineral activities, recreation and livestock grazing, with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A substantial portion of the wages associated with the existing and estimated future jobs in the WSAs would be returned to the local economy. Assuming each job at the annual average Utah wage rate of about \$12,000 per capita, this would result in relatively small contributions to the economy, widely dispersed primarily in the three MCDs noted under employment above. A multiplier effect would further disperse a portion of these wages within the local economy. Major capital expenditures for future mineral exploration, mining, or oil and gas extraction in WSAs probably would be made outside of the WSA localities.

Conclusion: Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs not designated as wilderness and having predicted long-term potential for major tar sand and coal projects.

- Federal Revenues and Returns to the Local Economy

As noted in Table 80, existing Federal revenues from the 83 WSAs totalled \$1,264,317 in 1987. This varies somewhat from year to year. Although it is considered to be a baseline figure; it also reflects the current low market interest in oil and gas exploration as well as the current prohibition on new leases in WSAs.

With the BLM Proposed Action Alternative, Federal revenues from existing and additional leasing in WSAs would continue to be a very small percent of the Statewide total. Those from livestock grazing in WSAs would continue generally at existing levels and increases would be precluded in the designated areas. Revenues from existing commercial recreation would continue and would increase consistent with normal baseline growth patterns. None of the increases in revenues would exceed the 5 percent significance standard, unless major mineral development were to

occur in the long term in WSAs not designated as wilderness.

- Areas Designated

In areas proposed for wilderness designation, existing revenues from livestock grazing would continue. Mineral revenues from leases held by production or with other prior rights would continue, and an increase in commercial recreation fees is predicted; however, these fees would not increase dramatically since the 3 most popular areas already are used to near capacity. Potential annual revenues of about \$2.4 million from speculative oil and gas leases and \$1,451 from potential increases in livestock AUM production would be foregone.

- Areas Not Designated

With the BLM Proposed Action Alternative, about 75 percent of the existing government revenues except recreation is attributed to areas not proposed for designation. These would continue. In addition, it is assumed that most areas within WSAs not designated would be made available to new speculative oil and gas leasing and, with an estimated 80 percent under lease at any one time and a minimum lease rate of \$2 per acre, this could result in up to about \$2 million per year in Federal revenue. Generally, 50 percent of this increase would be transferred to the State, and a variable part of the State's share would be forwarded to local entities.

Also, in the areas not proposed, it is estimated that increases in livestock grazing of 2,466 AUMs within the WSAs would add about \$3,798 per year to Federal revenues. Increases in commercial recreation in areas not designated would result in very limited increases of Federal revenues, unless new recreation facilities were developed to public fee collection standards. Parts of the grazing fees and any commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy.

Conclusion: The net impact on Federal revenues would be an increase of less than \$2 million per year, primarily due to speculative oil and gas leases. It would be insignificant on a Statewide basis.

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Impacts on Wilderness Values

- Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

Because none of the 3,235,834 acres in the 83 WSAs would be designated wilderness with this alternative, naturalness values which are found on 3,205,047 acres would not receive the degree of protection afforded by application of the BLM Wilderness Management Policy (BLM Manual 8560).

Even without wilderness designation, the potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in land use plans. For example, mining claim withdrawals would continue on 325,184 acres; oil and gas leasing Category 3 or 4 designations, which allow for no surface occupancy or no leasing, respectively, would continue on 834,706 acres; ORV closures or restrictions would continue on 1,079,676 acres; and VRM Class I or II designations, which allow for only natural ecological change or nonevident man-made change, respectively, would continue on 1,965,753 acres. Most of the undesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, direct loss of naturalness from disturbance would be expected on approximately 58,968 acres within 64 of the WSAs. No disturbance or resulting loss of naturalness is expected within 19 of the WSAs. The disturbance would be due to such activities as mineral exploration and development, providing access to State in-holdings, rangeland projects, vegetation treatments, ORV activity, community expansion, campground construction, and development of rights-of-way.

Loss of naturalness would be perceived in the surrounding areas, as well as in the directly disturbed areas. Generally, the areas of perceived loss would be in isolated portions of the unit and would not affect naturalness in the WSA as a whole. The following WSAs are exceptions where loss of naturalness would be perceived throughout much of the WSA: Fiddler

Butte, French Spring-Happy Canyon, and Winter Ridge.

The projected loss of naturalness is not only based on resource values, but also on the continuation of present management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of naturalness greater than projected here.

Conclusion: Naturalness values would not be protected by wilderness designation with this alternative, and loss would occur as intrusions increase. In the foreseeable future, disturbance would directly impair naturalness values on an estimated 58,968 acres.

- Solitude

In general, opportunities for solitude would be directly lost by the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. The quality of opportunities would also be reduced by such indirect impacts as noise and dust that would result during the period of development, and by increases in visitor use, particularly use involving vehicular activity.

Because none of the 3,235,834 acres in 83 WSAs would be designated wilderness with this alternative, outstanding opportunities for solitude which are found on approximately 2,298,801 acres would not receive the degree of protection afforded by application of the Wilderness Management Policy.

Even without wilderness designation, the potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in the Naturalness section. Most of the undesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, loss of solitude resulting directly from surface disturbance would be expected on approximately 58,968 acres within 64 WSAs. No disturbance or resulting loss of solitude is anticipated in 19 WSAs. The indirect reduction in quality of solitude, although generally temporary, would be expected on approximately 614,314 additional acres.

WSAs where potential disturbance would directly or indirectly affect solitude on more than 20 percent of

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the WSA include the following: North Stansbury Mountains, Deep Creek Mountains, Rockwell, Swasey Mountains, Moquith Mountain, Wahweap, Fifty Mile Mountain, Dirty Devil, French Spring-Happy Canyon, Fiddler Butte, Negro Bill, Horseshoe Canyon (North), San Rafael Reef, Devils Canyon, Sids Mountain, Mexican Mountain, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, Winter Ridge, and Lost Spring Canyon.

Increases in visitor use over time would be diffused throughout the 83 WSAs and would generally have little affect on opportunities for solitude. In some smaller WSAs, in WSAs comprised of narrow canyons, in popular areas, and in ORV use areas, increases would reduce solitude. The following WSAs may be affected in one or more of these ways: Cedar Mountain, Parunuweap Canyon, Moquith Mountain, Paria-Hackberry, The Cockscomb, Phipps-Death Hollow, Grand Gulch, Fish Creek Canyon, Mule Canyon, Cheesebox Canyon, Behind the Rocks, Mill Creek Canyon, Negro Bill Canyon, San Rafael Reef, Crack Canyon, Devils Canyon, Sids Mountain, and Mexican Mountain.

As with naturalness, the projected loss of solitude is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of the opportunities for solitude greater than projected here.

Conclusion: Opportunities for solitude in the 83 WSAs would not be protected by wilderness designation, and loss would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, direct loss of solitude would occur on 58,968 acres, and indirect reduction in the quality of solitude would occur on as much as 614,314 additional acres.

• Primitive and Unconfined Recreation

As with solitude, opportunities for primitive and unconfined recreation would be directly lost by mineral exploration and development, road and other rights-of-way development, resource development, and ORV use. Opportunities would also be indirectly reduced in quality by dust and noise that would result in the surrounding area during the period of disturbance, and by increases in visitor use, particularly use involving vehicular activity.

Because none of the 3,235,834 acres in 83 WSAs would be designated wilderness with this alternative, outstanding opportunities for primitive and unconfined recreation which are found on approximately 2,041,467 acres, would not receive the degree of protection afforded by application of the Wilderness Management Policy.

Even without wilderness designation, the potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of the management restrictions identified in the Naturalness section. Most of the nondesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, approximately 58,968 acres of surface disturbance would result in direct loss of opportunities for primitive and unconfined recreation. An indirect reduction in the quality of opportunities for primitive recreation would occur on an additional 614,314 acres.

The WSAs where potential disturbance would either directly or indirectly affect primitive recreation opportunities on more than 20 percent of the WSA are the same as identified for solitude.

Increases in visitor use over time would be diffused throughout the 83 WSAs and would generally have little effect on opportunities for primitive and unconfined recreation. In some smaller WSAs, in WSAs comprised of narrow canyons, in popular areas, and in ORV use areas, increases would reduce the quality of opportunities for primitive and unconfined recreation. The WSAs that may be affected in one or more of these ways are the same WSAs identified for solitude.

The projected loss of opportunities for primitive and unconfined recreation is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of opportunities for primitive and unconfined recreation greater than projected here.

Conclusion: Opportunities for primitive and unconfined recreation in the 83 WSAs would not be protected by wilderness designation, and loss would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, direct loss of opportunities would occur on 58,968 acres, and indirect

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reduction in the quality of opportunities would occur on up to an additional 614,314 acres.

- Special Features

Impacts on special features primarily would be caused by surface disturbance and by noise and vandalism which are related to ease or lack of access and the amount of visitation. Generally, special features are more difficult to manage in areas with disturbance, easy access, and high use than in undisturbed, remote areas.

Because none of the 3,235,834 acres in the 83 WSAs would be designated wilderness with this alternative, special features would not receive the degree of protection afforded by application of the BLM Wilderness Management Policy (BLM Manual 8560).

In this alternative, none of the special features in the 83 WSAs would be within designated wilderness areas. The distribution of special features is as follows: 77 WSAs have scenic features, 49 WSAs have historical features, 83 WSAs have ecological features, 80 WSAs have geological features, and 44 WSAs have other special features which include wild horses and/or perennial waters. None of the known cultural sites or inventory rivers or areas of high quality scenery would be within designated wilderness.

Most of the nondesignated land would be available for development, including upstream development, as well as for increases in ORV use that could disturb special features. In the foreseeable future, projected disturbance of approximately 58,968 acres would directly affect special features. Some special features (e.g., archaeological values and threatened, endangered, or candidate plants and animals) would continue to be protected by separate laws and policies. However, other special features (e.g., unusual plant or animal communities, geological features, scenic values, inventory river values) could be lost or reduced in quality by development or ORV use. Unless designated as wild and scenic rivers in the future, inventory rivers that flow through 15 WSAs would not be protected from dewatering or development. Rivers in six of the WSAs (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Sids Mountain, and Mexican Mountain) would be at risk because all of these have potential for conflicting development upstream that would result in reduction of water flow. The amount of water in inventory rivers

flowing through the other nine WSAs (Deep Creek Mountains, LaVerkin Creek, Steep Creek, Paria-Hackberry, Deep Creek, Grand Gulch, Desolation Canyon, Westwater, and Cheesebox Canyon) probably would not change much. This is because headwaters or intermittent streams are involved with minimal potential for development, or because of downstream National Park water needs, or because of downstream user rights, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

Increases in visitor use over time in most WSAs would have little effect on special features. The opportunity for increased ORV use to result in increased cultural resource vandalism would be greatest in the following WSAs: Fish Creek Canyon, Mule Canyon, and Cheesebox Canyon.

Conclusion: None of the special features found in the 83 WSAs would be protected with wilderness designation, and loss of these values would occur as intrusions and nonwilderness type uses increase.

Impacts on Water Uses

With the No Action/No Wilderness Alternative there would be no further constraints on water development and use within or upstream of the 83 WSAs. Water developments, including 54 proposed livestock reservoirs and two municipal water projects would not be constrained.

Existing constraints on the Virgin, Green, and Colorado Rivers, including releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the lower Colorado River Basin states, and consideration of water needs for endangered fish species would remain.

In addition, portions of rivers in 15 WSAs presently are identified for study under the Wild and Scenic River Act. Any impacts on water use resulting from designation of rivers as wild and scenic would be identified and evaluated in those studies and would be independent from wilderness designation.

Conclusion: The No Action/No Wilderness Alternative would not alter existing or future water uses or use considerations. Existing restrictions would remain.

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(No Action/No Wilderness Alternative)

Impacts on Mineral and Energy Exploration and Production

Implementation of the No Action/ No Wilderness Alternative would not result in wilderness constraints on mineral and energy development. All 83 WSAs would be managed for exploration and development of mineral and energy resources without consideration of wilderness values and as prescribed by BLM land use plans. Therefore, exploration and production of mineral and energy resources would not be constrained by implementation of the No Action/No Wilderness Alternative. As detailed in the Minerals section of Chapter 3, 48 WSAs have a predicted moderate to high certainty of occurrence of energy and mineral resources (Table 45).

Approximately 2,719,337 acres (about 84 percent of the total WSA acreage) would remain open to oil and gas leasing (see Table 47). Production of natural gas would continue to occur in the Jack Canyon, Desolation Canyon, and Winter Ridge WSAs. In total, oil and gas exploration is projected to occur in 25 WSAs in the foreseeable future. In addition to the three WSAs discussed above, possible development is projected for the Phipps-Death Hollow, Behind the Rocks, Turtle Canyon, Floy Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon WSAs. In addition, a carbon dioxide gas resource is located in the Phipps-Death Hollow WSA and potential development would be managed according to BLM's land use planning for this area. In 1988, Utah produced over 33 million barrels of oil and 62,300 million cubic feet of natural gas. None of the oil produced came from the WSAs. Approximately 437.5 million cubic feet of natural gas was produced from WSAs in 1988 constituting less than one percent of the Statewide total. In addition to conventional methods, significant amounts of oil are projected to eventually be produced from tar sand resources (99,030 acres in two STSAs located in the Winter Ridge, Fiddler Butte, and French Spring-Happy Canyon WSAs). No production is projected from the remaining tar sand areas located in WSAs due to low resource values and nonwilderness environmental constraints. Based on available data, BLM does not project that oil and gas production from the WSAs would exceed 5 percent of the Statewide total at any one point in time.

In 1988, 15.36 million short tons of coal were produced from Federal lands in Utah. None of this production came from within WSAs. However, substantial amounts of in-place coal are located in 15 WSAs. BLM

projects that exploration and eventual development of the coal resource would occur in 10 of these WSAs (see Appendix 6).

An estimated 5.1 billion short tons of in-place coal resource is located within the WSAs. This represents approximately 17 percent of the total in-place resource in the State of Utah. The majority of coal in the WSAs is located on the Kaiparowits Plateau and seven of the 10 WSAs with projected coal development are located on the Kaiparowits Plateau. Kaiparowits coal will become increasingly important as the coal in the Emery, Book Cliffs, and Wasatch Plateau coal fields is depleted. Therefore, a significant amount of the coal mined in Utah will eventually come from the Kaiparowits coal field. The other three WSAs (Mt. Ellen-Blue Hills, Turtle Canyon, and Desolation Canyon) would produce an undetermined, but minor amount of coal on a Statewide basis. Production in the Mt. Ellen-Blue Hills WSA is expected to be minor because coal quality is lower and there are existing environmental constraints for the protection of bison and big horn sheep. Development within the Desolation Canyon and Turtle Canyon WSAs would be a minor part of a larger development outside of the WSA.

With this alternative, locatable mineral exploration and development would be possible on 2,910,650 acres (about 90 percent of the total WSA acreage) that are not currently withdrawn from mineral entry. The remaining 325,184 acres would remain closed to locatable mineral entry. BLM projects that in the foreseeable future, disseminated gold would be produced from the Swasey Mountain WSA. Copper and vein type silver and gold would be explored for and likely produced from the North Stansbury Mountain, Deep Creek Mountains, Mt. Pennell, Mt. Hillers, and Little Rockies WSAs. Uranium and vanadium production is projected for the Mt. Hillers, Little Rockies, Bridger Jack Mesa, Horseshoe Canyon (North), San Rafael Reef, Crack Canyon, Muddy Creek, Sids Mountain, and Mexican Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to 10 additional WSAs (see Appendix 6). However, based on existing data, production of these energy and mineral resources from the WSAs listed is not expected to be significant on a Statewide basis. It is important to understand, however, that additional exploration could result in the discovery of major deposits of mineral and energy resources not currently known to occur in the WSAs. Additionally, new technologies could create demands for minerals not now believed to be economically important or reduce the demand for

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minerals now considered to be valuable. Lastly, new development techniques could result in currently uneconomic deposits becoming economically viable.

Conclusion: Implementation of the No Action/No Wilderness Alternative would not adversely affect mineral exploration or production in any of the WSAs. On a Statewide basis, substantial amounts of oil, gas, and coal are predicted to be explored for and/or produced from up to 35 WSAs in the foreseeable future. Locatable minerals would be explored for and/or developed in up to 23 WSAs in the foreseeable future. Locatable mineral production would not be significant on a Statewide basis.

Impacts on Local Economic Conditions

The No Action/No Wilderness Alternative would continue various uses in the WSAs, in accordance with BLM land use plans. It would accommodate new exploration and possible extraction of minerals, and new projects for livestock in many of the WSAs, primarily for the purpose of economic development.

With the No Action/No Wilderness Alternative, the predicted baseline for population and employment would not be expected (see Chapter 3). Any increases in future employment attributed to activities in WSAs are expected to occur primarily in the Central, Southeast, and Southwest MCDs, mostly in those counties with sparse populations (see Figure 7). While the existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8).

• Local Employment

With this alternative, the existing activities would continue within all 83 WSAs and the associated employment would continue. Few, if any, existing jobs are totally dependent on activities within the WSAs. Estimated continued existing employment would be comprised of portions of about 12 jobs in minerals, 50 in livestock, none in forestry, and 74 in commercial recreation.

Continued activities in WSAs, without wilderness designation, would result in gradual increases in jobs in or related to the WSAs. These increases would be about the same percentage as the baseline forecasts (Figure 8) for each respective MCD, from 1980 to 2010. The employment mix trends would continue,

with trade and services (such as for recreation) becoming a greater percentage of the Statewide economy, with agriculture and mining becoming a smaller percentage (Utah Office of Planning and Budget, 1987). The change in employment directly associated with WSAs, with no wilderness designation, would be insignificant on a Statewide basis.

In the long term, future (beyond the year 2010) potential mineral development in 7 WSAs could lead to creation of a substantial new employment, if the technology and/or markets associated with tar sand and coal were to substantially improve. In the long term, extraction of bitumen from tar sand in the Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge WSAs would substantially increase employment in the eastern Emery, Wayne, and Uintah Counties. Likewise in the long term, production of large amounts of coal from the WSAs in the Kaiparowits region would substantially increase employment in the Garfield and Kane Counties. These activities would be significant on a local or regional basis, but would have only a small effect on the Statewide situation.

In the long term, tar sand or coal development in the WSAs would lead to significant increases in population, employment, and income for those counties directly affected. Employment of persons would be greater than a 5 percent increase in the projected total local employment in 2010. It would create extensive changes in socioeconomic conditions affecting all economic sectors and the infrastructures of the small local communities. Both beneficial and adverse impacts would occur. Beneficial impacts include increased personal income and tax base while adverse impacts would result from increased demands on infrastructures such as schools and utilities. For more information on the nature of socioeconomic impacts of tar sand and coal development in central and southern Utah, the reader is referred to the Tar Sand Triangle Draft EIS (USDI, NPS and BLM, 1984) the Utah Combined Hydrocarbon Leasing Regional Final EIS (USDI, BLM, 1984c), and the Uinta - Southwestern Regional Coal EIS (USDI, BLM 1981c and 1982c).

Continued extraction of oil and gas from the Winter Ridge, Desolation Canyon, Jack Canyon, and other WSAs in the Book Cliffs region would tend to stabilize related employment in the Uintah, eastern Emery, and northern Grand counties. This could have local significance.

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Increasing emphasis on tourism and related employment in Utah would continue, and would involve recreation uses within some of the WSAs, primarily those that already receive considerable tourism related use, such as the Desolation Canyon, Westwater, Grand Gulch, and North Escalante Canyon/The Gulch WSAs. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals.

Conclusion: Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of tar sand, bitumen, and Kaiparowits coal.

• Local Sales

The No Action/No Wilderness Alternative would continue the local sales patterns relative to existing activities within the WSAs.

Projected increases in mineral activities, recreation on livestock grazing, with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A substantial portion of the wages associated with the future local jobs in the WSAs would be returned to the local economy. Assuming the annual average Utah wage rate of about \$12,000 per capita, would contribute moderate increases in local income, widely dispersed primarily in the Southwest, Central, and Southeast MCDs. A multiplier effect would further disperse a portion of these wages within the local economy. Major capital expenditures attributed to future mineral exploration, mining, or oil and gas extraction in WSAs likely would be made outside of the WSA localities.

Conclusion: Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs with long-term potential for major tar sand and coal projects.

• Federal Revenues and Returns to the Local Economy

As noted in Table 80, existing Federal revenues from the 83 WSAs totalled \$1,264,317 in 1987. The amount varies somewhat from year to year but is con-

sidered to be a representative figure. The No Action/No Wilderness Alternative would continue the existing level of Federal revenues, except it could increase if market conditions encouraged expanded speculative leasing. Should this occur, it is assumed that up to 2,719,337 acres within WSAs would be made available to new speculative oil and gas leasing and, with an estimated 80 percent under lease at any one time and a minimum lease rate of \$2.00 per acre, this could result in up to about \$4.4 million in Federal revenue. Generally, 50 percent of this increase would be transferred to the State, and a variable part of the State's share would be forwarded to local entities. Federal revenues from additional leasing in WSAs would be about 9 percent of the Statewide total.

It is estimated that increases in livestock grazing of 3,408 AUMs with the WSAs would add about \$5,248 to Federal revenues, and increases in commercial recreation would result in about \$4,000 per year in Federal revenues. Parts of the grazing fees and the commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy. Revenues from additional livestock grazing in WSAs would be about 0.4 percent of the Statewide total.

Except for speculative leases for oil and gas, none of the increases in revenues would exceed the 5 percent significance standard on a Statewide basis.

Conclusion: It is estimated that annual Federal revenues would be about \$4.4 million for mineral leases. They would increase by \$5,248 per year for livestock grazing, and be up to \$4,000 per year for recreation in the foreseeable future. Annual recreation revenue increases would reflect the normal baseline growth patterns. In the long term, Federal revenues may increase as a result of future royalties from tar and coal extraction.

REGIONAL REPRESENTATIVE AREAS ALTERNATIVE

Impacts on Wilderness Values

• Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

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- Areas Designated

Wilderness designation of all of six WSAs and parts of eight WSAs (956,616 total acres) included in this alternative would protect naturalness values on about 30 percent of the acreage in the 83 WSAs. All designated acres in this alternative meet the Wilderness Act criteria for naturalness. With this alternative, management of the designated areas according to the Wilderness Management Policy (BLM Manual 8560) would largely remove the potential for future surface disturbance that would reduce naturalness. Complete preservation of naturalness is anticipated in the designated portions of three of the 14 WSAs. Although protected, complete preservation of naturalness in the designated portions of the remaining 11 WSAs is not anticipated, largely due to the existence of valid existing rights. In the foreseeable future, naturalness values in the designated portion of these WSAs would be directly lost on approximately 279 acres due to surface disturbance. The surface disturbance would be due to mineral-related activities, providing access to State inholdings, and development of allowable rangeland projects. There would be an additional perceived loss of naturalness in the area surrounding the disturbance. However, naturalness values would be preserved in the designated area as a whole in all cases. There is no acreage that would be designated with this alternative where naturalness values would be administratively difficult to preserve.

- Areas Not Designated

Naturalness values would not receive the same degree of protection on the 2,279,218 acres not designated wilderness with this alternative. The potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in land use plans. For example, mining claim withdrawals would continue on 96,628 acres; oil and gas leasing Category 3 or 4 designations, which allow for no surface occupancy or no leasing, respectively, would continue on 366,912 acres; ORV closures or restrictions would continue on 373,126 acres; and VRM Class I or II designations, which allow for only natural ecological change or nonevident man-made change, respectively, would continue on 1,147,977 acres. Most of the nondesignated land

would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, direct loss of naturalness would be expected on approximately 53,740 acres within the 69 nondesignated WSAs and the nondesignated portions of eight WSAs. Loss of naturalness would be indirectly perceived in the surrounding areas, as well as in the directly disturbed area. In most WSAs the areas of perceived loss would be in isolated portions of the unit and would not affect naturalness in the nondesignated area as a whole. The following WSAs are exceptions where loss of naturalness would be perceived throughout much of the nondesignated area: Fidler Butte, French Spring-Happy Canyon, and Winter Ridge.

The projected loss of naturalness in the nondesignated areas is not only based on resource values, but also on the continuation of present management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of naturalness greater than projected here.

Conclusion: Naturalness values would be preserved overall in the designated areas, which comprise about 30 percent of the total acreage in the 83 WSAs. Naturalness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 54,019 acres. About 99 percent of the loss would be in nondesignated areas.

- Solitude

In general, opportunities for solitude would be directly lost by the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. Opportunities would also be indirectly reduced in quality by such impacts as noise and dust that would result during the period of development, and by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of six WSAs and parts of eight WSAs (956,616 total acres) included in this alternative would protect the solitude

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(Regional Representative Areas Alternative)

values in about 30 percent of the acreage in the 83 WSAs. A total of 893,961 of the designated acres in this alternative have outstanding opportunities for solitude, and 62,655 do not.

With this alternative, the potential for development and vehicular activity that would impair solitude would be eliminated or largely reduced in the designated areas. Complete preservation of solitude is anticipated in the designated portions of three of the 14 WSAs. Although protected, complete preservation of solitude in the designated portions of the remaining 11 WSAs is not anticipated, due to the same reasons identified in the analysis for naturalness. In the foreseeable future, solitude values in the designated portion of these WSAs would be directly lost on approximately 279 acres, and indirectly reduced on an additional 26,340 acres. Solitude would be preserved in the designated area as a whole in all cases. There are no WSAs with this alternative where opportunities for solitude would be administratively difficult to preserve.

Increases in visitor use over time would be diffused throughout the designated areas, would be primitive in nature, and would generally have little affect on opportunities for solitude. In some smaller WSAs, in WSAs comprised of narrow canyons, and in popular areas where increases would reduce the quality of solitude, wilderness management plans would identify and require the use of visitor management techniques, such as use restrictions, to preserve solitude. The following WSAs may be affected in this way: Grand Gulch ISA Complex and Behind the Rocks.

• Areas Not Designated

Solitude would not receive the same degree of protection on the 2,279,218 acres not designated wilderness with this alternative. Most of the nondesignated land would be available for development, as well as for increases in ORV use. In the foreseeable future, loss of solitude resulting directly from surface disturbance would be expected on approximately 53,740 acres within the 69 nondesignated WSAs and the nondesignated portions of eight WSAs. Indirect reduction in the quality of solitude, although generally temporary, would involve as many as 539,041 additional acres in the nondesignated areas.

WSAs where potential disturbance would directly or indirectly affect solitude on more than 20 percent of the WSA include the following: North Stansbury Mountains, Deep Creek Mountains, Rockwell, Swasey Mountains, Moquith Mountain, Fifty Mile Mountain, Dirty Devil, French Spring-Happy Canyon, Fiddler Butte, Negro Bill, Horseshoe Canyon (North), Devils Canyon, Mexican Mountain, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, Winter Ridge, and Lost Spring Canyon.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce the quality of opportunities for solitude, particularly where increased use would be largely vehicular in nature. The WSAs where increased visitor use in the nondesignated area would significantly affect opportunities for solitude are: Cedar Mountains, Moquith Mountain, Paria-Hackberry, The Cockscomb, Devils Canyon, Sids Mountain, Crack Canyon, Mexican Mountain, Fish Creek Canyon, Mule Canyon, Cheesebox Canyon, Mill Creek Canyon, and Negro Bill Canyon.

As with naturalness, the projected loss of solitude in the nondesignated areas is not only based on resources, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there will be a cumulative loss of solitude greater than projected here.

Conclusion: Opportunities for solitude would be preserved overall in the designated areas, which comprise approximately 61 percent of the total acreage in the 83 WSAs. Opportunities for solitude would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, a direct loss of solitude would occur on approximately 41,248 acres, and an indirect reduction in the quality of solitude would occur on up to an additional 465,947 acres. About 99 percent of the loss would be in nondesignated areas.

• Primitive and Unconfined Recreation

As with solitude, opportunities for primitive and unconfined recreation would be directly lost by mineral exploration and development, road and other rights-of-way development, resource development, and vehicle use. These opportunities would also be indirectly

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reduced in quality by dust and noise that would result during the period of disturbance, and by increases in visitor use, particularly use involving vehicular activity.

• Areas Designated

Wilderness designation of all of six WSAs and parts of eight WSAs (956,616 acres) would protect the primitive and unconfined recreation values in about 30 percent of the acreage in the 83 WSAs. In this alternative, 893,961 acres of the designated acres in the 14 WSAs have outstanding opportunities for primitive and unconfined recreation, and 62,655 acres do not. All of the designated areas have outstanding opportunities for primitive and unconfined recreation.

With this alternative, the potential for disturbance and vehicular activity that would impair opportunities for primitive and unconfined recreation would be eliminated or largely reduced in the designated areas. Still, in the foreseeable future, approximately 279 acres of surface disturbance in the designated portions of 11 of the 14 WSAs would result in some loss. The disturbance would be due to the same activities identified for solitude. There would be an additional indirect reduction in the quality of opportunities on 26,340 acres in the designated areas. However, opportunities for primitive and unconfined recreation would be preserved in the designated area as a whole in all cases. There are no WSAs that would be designated with this alternative where opportunities for primitive recreation would be administratively difficult to preserve.

Increases in primitive-type visitor use over time would be diffused throughout the designated acres and would generally have little effect on opportunities for primitive and unconfined recreation. In popular or small designated areas where visitor use increases could reduce solitude, wilderness management plans would use visitor management techniques such as use restrictions to preserve solitude. Behind The Rocks and Grand Gulch WSAs may be affected in this way.

• Areas Not Designated

Primitive and unconfined recreation values would not receive the same degree of protection on the 2,279,218 acres not designated wilderness with

this alternative. Most of the nondesignated areas would be available for development, as well as for increases in ORV use. In the foreseeable future, approximately 53,740 acres of surface disturbance in the nondesignated areas would result in direct loss of opportunities for primitive and unconfined recreation. The disturbance would be due to the same activities identified for solitude. There would be an additional indirect reduction in the quality of opportunities on 539,041 acres in the nondesignated areas.

Increases in visitor use over time in the nondesignated portions of some WSAs, would reduce the quality of primitive type recreation opportunities, particularly where increased use would be largely vehicular in nature. The WSAs where such use would significantly reduce opportunities to primitive recreation are the same as identified for solitude.

The projected loss of opportunities for primitive and unconfined recreation in the nondesignated area is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of opportunities for primitive and unconfined recreation greater than projected here.

Conclusion: Opportunities for primitive and unconfined recreation would be preserved overall in the designated areas, which comprise approximately 30 percent of the total acreage in the 83 WSAs. Primitive recreation opportunities would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur on about 54,019 acres, and an indirect reduction in the quality of these opportunities would occur on up to an additional 565,381 acres. About 99 percent of the loss would be in nondesignated areas.

• Special Features

Impacts on special features primarily are caused by surface disturbance and by noise and vandalism which are related to ease or lack of access and the amount of visitation. Generally, special features are more difficult to manage in areas with disturbance, easy access, and high use than in undisturbed, remote areas.

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• Areas Designated

Wilderness designation of all of six WSAs and parts of eight WSAs (956,616 total acres) would contribute to the preservation of special features which are found in all of these WSAs. The potential for surface disturbance, water diversion, and vehicular activity that would harm special features would be eliminated or largely reduced in the designated areas. The approximately 279 acres of surface disturbance projected to occur in the designated areas in the foreseeable future would affect much less than 1 percent of the designated acreage and would be designed to have little affect on special features.

With this alternative, the distribution of special features found in the 14 WSAs that would be designated are as follows: 14 WSAs have scenic features, 13 WSAs have historical features, 14 WSAs have ecological features, 14 WSAs have geological features, and eight WSAs have other special features which include wild horses and/or perennial waters. Approximately 1,222 of 2,246 known cultural sites in the WSAs would be in the designated areas. Of the known cultural sites, 89 are on the National Register, 87 of which would be in designated areas, and approximately 898 are eligible for the National Register, 816 of which would be in designated areas.

A total of 739,344 acres of Class A scenery would be protected by wilderness designation. This is approximately 42 percent of the high quality scenery of the 83 WSAs under consideration, approximately 22 percent of the high quality scenery on BLM lands in Utah, and an estimated 8 percent of the high quality scenery in the State.

Of the 15 WSAs that have wild and scenic inventory rivers flowing through them, five of these WSAs would be designated at least in part, and the rivers would be largely within the designated areas. In theory, wild and scenic inventory rivers would be protected not only by the fact that allowable surface disturbance would be minimal, but also because upstream projects that would require Federal permitting and that would affect water flow through the wilderness would probably not receive approval. This would be the case with the river in one of the 14 WSAs that would be designated with this alternative: Sids Mountain. The San Rafael River which flows through

this WSA has potential for conflicting upstream development. The amount of water in inventory rivers flowing through the other four WSAs that would be designated (Deep Creek Mountains, Grand Gulch, Desolation Canyon and Westwater) would be protected by wilderness designation, but would probably not change much even without wilderness designation. This is because headwaters or intermittent streams are involved with minimal potential for development, because of downstream National Park water needs, because of downstream user needs, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

Increases in primitive-type visitor use over time would be diffused throughout the designated areas and would have little affect on special features.

• Areas Not Designated

Special features would not receive the same degree of protection on the 2,279,218 acres not designated wilderness with this alternative. The special features in the 69 WSAs not designated are as follows: 63 WSAs have scenic features, 36 WSAs have historical features, 69 WSAs have ecological features, 66 WSAs have geological features, and 36 WSAs have other special features. Most of the nondesignated land would be available for development, as well as for increases in ORV use that could disturb special features. In the foreseeable future, projected disturbance of approximately 53,740 acres could affect special features. Some special features (e.g., archaeological values and threatened, endangered, or candidate plant and animals) would continue to be protected by separate laws and policies. However, other special features (e.g., unusual plant or animal communities, geological features, or scenic values) could be lost or reduced in quality by development or ORV use. Unless designated as wild and scenic rivers in the future, inventory rivers in the nondesignated portions of 10 WSAs (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Mexican Mountain, LaVerkin Creek, Steep Creek, Paria-Hackberry, Deep Creek, and Cheesebox Canyon), would not be protected from dewatering or development. At least some dewatering of rivers in four WSAs (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, and Crack Canyon) would be likely due to potential upstream development.

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Wilderness designation of Sids Mountain WSA would help safeguard the water flow through the Mexican Mountain WSA as well. Although not protected by wilderness designation, water flow in the other inventory river segments would probably not change.

Conclusion: Special features would be preserved overall in the designated areas, which comprise approximately 30 percent of the total acreage in the 83 WSAs. Special features would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness type uses increase. Approximately 19 percent of the wilderness special features found in the 83 WSAs would be protected by wilderness designation with this alternative.

Impacts on Water Uses

The Regional Representative Areas Alternative would designate 14 areas, with eight of these areas containing a total of 334.5 miles of perennial streams. Non-consumptive water uses such as recreation, aesthetics, and wildlife would be favored within the wilderness areas. About 384.5 miles of the 719 miles of perennial streams in WSAs would be in areas not designated as wilderness and would be open to future diversions and water consumptive developments.

Water use upstream of 6 of the 14 WSAs or portions of WSAs that would be designated wilderness would not be affected because they lack perennial streams. In addition, water uses would not be significantly affected in the designated WSAs because maintenance of existing facilities would be allowed and most water developments such as proposed catchments, guzzlers, spring developments etc., could be designed and installed consistent with wilderness protection guidelines.

Overall, seven proposed livestock reservoirs would be precluded, but this would not have a significant affect on livestock grazing on a Statewide basis. Municipal water developments would not be affected.

Designation of wilderness could hamper proposals or projects that would transfer water rights, consumptively use water upstream of WSAs or otherwise alter flow through the Deep Creek Mountains, Little Rockies, Dark Canyon, Sids Mountain, Desolation Canyon, and Westwater WSAs that are nonheadwater WSAs with perennial streams. This is because

changes in use or changes in points of diversion could be protested by the Federal government to maintain the existing water use patterns which now allow in-stream flow through the wilderness areas. The State Engineer could choose to accept or reject the protest, but the overall effect would be delay or uncertainty in project approvals. In addition, the Federal government could deny rights-of-way or other approvals for projects that would alter waterflow through designated wilderness.

Two of the six nonheadwater areas with perennial streams that would be designated with this Alternative, Desolation Canyon [Green River] and Westwater Canyon, are on the Green and Colorado Rivers upstream of the Canyonlands National Park. Wilderness would not add appreciably to existing constraints on development of these rivers which include releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the Lower Colorado River Basin states, and consideration of water needs for endangered fish species.

Three of the six nonheadwater WSAs with perennial streams (Deep Creek, Phipps-Death Hollow, and Little Rockies) have perennial streams that originate only a short distance above the WSA or are part of small drainages without the potential for major water projects upstream of the WSA. Therefore, few impacts, if any, on upstream uses would result from designation of these areas.

Sids Mountain and Desolation Canyon [Price River] WSAs have perennial streams that originate long distances above the WSAs and flow through areas where major water projects and diversions now occur or are likely in the foreseeable future. The affected drainages would be the San Rafael and Price Rivers. Wilderness water considerations would be placed on new projects that would divert and use water for coal mining and coal-fired electrical power generation and expansion of irrigation and reservoirs or other possible water consumptive projects in the Emery and Carbon Counties.

Conclusion: Nonconsumptive use of water for wilderness purposes would be favored in eight areas with perennial streams. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 12 of the 14 areas that would be designated with the Regional Representative Areas

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(Regional Representative Areas Alternative)

Alternative. This alternative could complicate future water diversion and use upstream of two designated areas in Emery and Carbon counties.

Impacts on Mineral and Energy Exploration and Production

Implementation of the Regional Representative Areas Alternative would place maximum limitations on potential mineral and energy resource development on 956,616 acres in all of six and portions of eight WSAs designated as wilderness as discussed in the All Wilderness Alternative. The remaining 2,279,218 acres in all of 69 and portions of eight WSAs would remain open to mineral and energy development subject to BLM land management plan guidance as discussed in the No Action/No Wilderness Alternative.

- Leasable Mineral Production

- Areas Designated

In the areas designated as wilderness, all 956,615 acres would be closed to oil and gas leasing. However, existing pre-FLPMA oil and gas leases on 5,174 acres located within the designated portions of 2 WSAs (Phipps-Death Hollow, Desolation Canyon) could be explored and developed per stipulations attached at the time of lease issuance. BLM projects that development would occur only in the Desolation Canyon WSA.

Exploration and development of existing post-FLPMA leases on 61,729 acres could also occur subject to nonimpairment provisions. However, BLM projects that these leases would expire without any exploration or development activities occurring. Because the remaining 889,712 acres in the designated wilderness areas also would be closed to leasing, no oil and gas exploration or development would occur in these areas. An undetermined amount of oil and gas could be extracted from designated areas by drilling activities adjacent to designated wilderness boundaries.

No oil and gas leases under application for conversion to combined hydrocarbon leases would be located within the designated portions of the WSAs. No additional applications or actual lease conversions are projected to occur prior to wilderness designation. New competitive leasing for tar sand in the designated portions of the WSAs would not be allowed following wilderness designation. Be-

cause the major tar sand areas would not be designated wilderness with this alternative, significant tar sand resources would not be foregone.

No coal leases or PRLAs are located within the designated portions of the WSAs. New coal leasing would not be allowed once wilderness designation occurred. Portions of three WSAs (Fifty Mile Mountain, Mt. Ellen-Blue Hills, Desolation Canyon) that have coal development possibilities would be designated wilderness. Production of coal resources within these areas would be foregone. However, the majority of the coal resource found in the WSAs is located in the nondesignated areas with this alternative. Therefore, the amount of coal foregone would not be significant on a State-wide basis.

- Areas Not Designated

In the nondesignated portions of the WSAs, approximately 2,108,403 acres would remain open to oil and gas leasing as discussed in the No Action/No Wilderness Alternative. Production of natural gas would continue to occur in the Jack Canyon, Desolation Canyon, and Winter Ridge WSAs. In addition, oil and gas exploration and possibly development is projected for Turtle Canyon, Floy Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon WSAs, and exploration activities are projected for several other WSAs. Approximately 170,815 acres would remain closed to leasing (see Appendix 6).

BLM projects that exploration and eventual development of the coal resource would occur in seven WSAs (not designated wilderness) and the nondesignated portions of three other WSAs. Exploration and development would occur as discussed in the No Action/No Wilderness Alternative. The majority of development would occur on the Kaiparowits Plateau. Lesser amounts of coal would also be produced from Turtle Canyon and the nondesignated portions of Mt. Ellen-Blue Hills and Desolation Canyon WSAs.

No development of the oil shale resource, potash, phosphate, or any other leasable minerals are projected to occur in either the designated or nondesignated portions of any of the WSAs in the foreseeable future. No development of the geothermal or hydropower resource is projected. Therefore, implementation of the Regional Representative

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Areas Alternative would not result in the foregoing of any of these resources.

Conclusion: With the Regional Representative Areas Alternative, oil and gas resources projected to be explored or developed in all or part of five WSAs would be foregone with the exception of portions of Two WSAs which contain 5,174 acres of pre-FLPMA leases. Development of the tar sand and coal resource would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. No development of any other leasable mineral or energy resources is projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the non-designated portions of the WSAs.

- Locatable Mineral Production

- Areas Designated

All 956,616 acres within the designated portions would be withdrawn from locatable mineral entry. However, development work, extraction, and patenting would be allowed to continue on 1,857 existing mining claims (37,140 acres) and any future mining claims located prior to wilderness designation. Copper and vein type silver and gold would be explored for and possibly developed from Deep Creek Mountains and Little Rockies WSAs. Uranium and vanadium production is projected for Little Rockies, San Rafael Reef, and Sids Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to three additional WSAs (see Appendix 6).

Exploration and development activities would be restricted to valid mining claims existing at the time of designation. Any locatable minerals located within the designated wilderness areas, but not under valid mining claim could not be developed with this alternative, and production of locally significant amounts of gold, silver, copper, uranium and vanadium would be foregone. Based on existing data, loss of locatable minerals would not be significant on a Statewide or national basis. It is not projected that significant amounts of any other locatable minerals would be foregone with this alternative.

- Areas Not Designated

With this alternative, locatable mineral exploration and development would be possible on 2,182,590 nondesignated acres. No wilderness constraints would be placed on locatable minerals in these areas, therefore, exploration and development could occur as discussed in the No Action/No Wilderness Alternative. Some 96,628 acres would remain closed to mineral entry as discussed in the No Action/No Wilderness Alternative.

Conclusion: Exploration and/or development of mining claims would occur on 23 WSAs. Wilderness designation would limit activities would limit activities to existing mining claims in seven of the 23 WSAs. In designated areas locatable minerals would be foregone however, this would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

Impacts on Local Economic Conditions

The Regional Representative Areas Alternative includes 956,616 acres in WSAs where wilderness designation could affect economic development. There would be 2,279,218 acres in WSAs that would not be designated wilderness where existing socioeconomic factors would continue.

- Local Employment

- Areas Designated

Existing employment would continue; however, the potential for new development and new employment would be foregone for most minerals and new livestock activities that might otherwise occur in the designated areas. For the WSAs designated as wilderness, the only increases in employment would be new mineral activities allowed under prior existing rights and new commercial recreation activities.

Increased recreation use could occur, with additional employment attributed to commercial outfitters, particularly in some of those WSAs that now receive substantial amounts of tourism-related use, such as Desolation Canyon, Westwater, and Grand Gulch WSAs. The increase would be relatively small, however, since commercial recreation in these 3 areas already is at

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(Regional Representative Areas Alternative)

or near capacity. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals.

- Areas Not Designated

With this alternative, the existing activities would continue within all of 69 WSAs and portions of 8 WSAs not designated. Employment related to activities in the nondesignated areas involves portions only a small number of existing jobs.

In addition, the projected activities for all or parts of the 77 areas not designated wilderness would occur. This would include mineral exploration, mineral development, increases in livestock grazing, additional commercial recreation, and in many WSAs no new activities. The projected actions are estimated to result in a gradual increase in local employment within the foreseeable future. Many of these future jobs (those associated with mineral exploration) would be temporary within the WSAs. Most of the recreation jobs would be seasonal.

In the long term, added potential mineral development in WSAs not designated could lead to creation of new jobs, if the technology and/or markets associated with coal and tar sand were to improve. In the long term, extraction of bitumen from tar sand in the Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge WSAs would substantially increase employment in eastern Emery, Wayne, and Uintah counties. Likewise, in the long term, production of large amounts of coal from the WSAs in the Kaiparowits region would substantially increase employment in the Garfield and Kane Counties. Continued extraction of oil and gas from Winter Ridge, part of Desolation Canyon, Jack Canyon, and portions of other WSAs in the Book Cliffs region would tend to stabilize (and possibly increase related employment in Uintah, eastern Emery, and northern Grand Counties. This Regional Representative Areas Alternative would not constrain socioeconomic potentials related to future tar sand or coal development; therefore the situation regarding this aspect would be the same as described for the No Action/No Wilderness Alternative.

Increasing emphasis on tourism and related employment in Utah would continue and could result in new commercial recreation activities within some of the WSA areas not designated, such as the North Escalante Canyons/The Gulch, Steep Creek, Mt. Pennell, Fish Creek Canyon, Spruce Canyon and Flume Canyon.

Conclusion: With the Regional Representative Areas Alternative, the predicted baseline for population and employment would not be significantly altered (see Chapter 3). While existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8). Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of tar sand and Kaiparowits coal. The employment impacts for this alternative essentially would be about the same as for the No Action/No Wilderness Alternative.

- Local Sales

The Regional Representative Areas Alternative would continue local sales patterns relative to existing activities within the WSAs.

Continuation of existing activities and increases in mineral activities, recreation and livestock grazing with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A portion of the wages associated with the existing and future jobs in the WSAs would be returned to the local economy. Assuming each job at the annual average Utah wage rate of about \$12,000 per capita, this would make a relatively small addition to the economy, widely dispersed primarily in the three MCDs noted under employment above. A multiplier effect would further disperse a portion of these wages within the local economy. Any major capital expenditures attributed to future mineral exploration, mining, or oil and gas extraction in nondesignated WSAs probably would be made outside of the WSA localities.

Conclusion: Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent change) would occur in localities-

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immediately adjacent to the WSA areas having predicted long-term potential for major tar sand and coal projects. The nature and magnitude of such impacts would be similar to those of the No Action/No Wilderness Alternative.

- Federal Revenues and Returns to the Local Economy

None of the increases in revenues would exceed the 5 percent significance standard, unless major tar sand or coal developments were to occur in the long term.

- Areas Designated

In areas proposed for wilderness designation, existing revenues from livestock grazing would continue. A small increase in commercial recreation fees is predicted. Potential annual revenues of about \$1 million from speculative oil and gas leases and about \$601 from potential increases in livestock AUM production and fees would be foregone.

- Areas Not Designated

With the Regional Representative Areas Alternative, about 90 percent of the existing government revenues (except recreation) is attributed to areas not proposed for designation. These would continue. In addition, it is assumed that up to 2,108,403 acres within WSAs not designated and not otherwise in leasing Category 4 would be made available to new speculative oil and gas leasing and, with an estimated 80 percent under lease at any one time and a minimum lease rate of \$2 per acre, this could result in up to about \$3.4 million per year in Federal revenue. Generally, 50 percent of this increase would be transferred to the State, and a variable part of the State share would be forwarded to local entities.

Also, in the areas not proposed, it is estimated that increases in livestock grazing of 3,018 AUMs within the WSAs would add about \$4,648 per year to Federal revenues, and increases in commercial recreation would result in additional small increases in Federal revenues. Parts of the grazing fees and the commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy.

Conclusion: Federal revenues would be an increase of up to about \$3.4 million per year in the foreseeable future, primarily as a result of speculative oil and gas leasing.

PARAMOUNT WILDERNESS QUALITY ALTERNATIVE

Impacts on Wilderness Values

- Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

- Areas Designated

Wilderness designation of all of 10 WSAs and parts of 22 WSAs (1,533,030 total acres) included in this alternative would protect naturalness values on about 47 percent of the acreage in the 83 WSAs. All designated acres in this alternative meet the Wilderness Act criteria for naturalness.

With this alternative, management of the designated areas according to the wilderness management policy would largely remove the potential for future surface disturbance that would reduce naturalness. Complete preservation of naturalness is anticipated in the designated portions of seven of the 32 WSAs. Although protected, complete preservation of naturalness in the designated portions of the remaining 25 WSAs is not anticipated, largely due to the existence of valid existing rights. In the foreseeable future, naturalness values in the designated portion of these WSAs would be directly lost on approximately 413 acres due to surface disturbance. The disturbance would be due to mineral-related activities, providing access to State inholdings and development of rangeland projects. There would be an additional perceived loss of naturalness in the area surrounding the disturbance. However, naturalness values would be preserved in the designated area as a whole in all cases. There are no WSAs that would be designated with this alternative where opportunities for naturalness would be administratively difficult to preserve.

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- Areas Not Designated

Naturalness values would not receive the same degree of protection on the 1,702,804 acres not designated wilderness with this alternative. The potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in land use plans. For example, mining claim withdrawals would continue on 81,576 acres; oil and gas leasing Category 3 or 4 designations, which allow for no surface occupancy or no leasing, respectively, would continue on 139,798 acres; ORV closures or restrictions would continue on 136,088 acres; and VRM Class I or II designations, which allow for only natural ecological change or nonevident man-made change, respectively, would continue on 723,179 acres. Most of the nondesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, direct loss of naturalness would be expected from disturbance on approximately 48,057 acres within the 51 nondesignated WSAs and the nondesignated portions of 22 WSAs. The disturbance would be due to such activities as mineral exploration and development, providing access to State in-holdings, rangeland projects, vegetation treatments, ORV activity, community expansion, campground construction, and development of rights-of-way.

Loss of naturalness would be perceived in the surrounding areas, as well as in the directly disturbed areas. In most WSAs the areas of perceived loss would be in isolated portions of the unit and would not affect naturalness in the nondesignated area as a whole. The WSAs where the loss of naturalness would be perceived throughout much of the nondesignated area are: Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge.

The projected loss of naturalness in the nondesignated areas is not only based on resource values, but also on the continuation of present management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of naturalness greater than projected here.

Conclusion: Naturalness values would be preserved overall in the designated areas, which comprise about

47 percent of the total acreage in the 83 WSAs. Naturalness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 48,470 acres. About 99 percent of the loss would be in nondesignated areas.

- Solitude

In general, opportunities for solitude would be directly lost due to the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. Opportunities would also be indirectly reduced in quality by such impacts as noise and dust that would occur during the period of development and, by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of 10 WSAs and parts of 22 WSAs (1,533,030 total acres) included in this alternative would protect the solitude values in about 47 percent of the acreage in the 83 WSAs. A total of 1,442,599 acres of the designated acres in this alternative have outstanding opportunities for solitude, and 90,431 acres do not.

With this alternative, the potential for development and vehicular activity that would impair solitude would be eliminated or largely reduced in the designated areas. Complete preservation of solitude is anticipated in the designated portions of seven of the 32 WSAs. Although protected, complete preservation of solitude in the designated portions of the remaining 25 WSAs is not anticipated, due to some reasons identified in the analysis for naturalness. In the foreseeable future, solitude values in the designated portions of these WSAs would be directly lost on approximately 413 acres and indirectly reduced in quality on up to an additional 37,694 acres. There are no WSAs that would be designated with this alternative where opportunities for solitude would be administratively difficult to preserve.

Increases in primitive visitor use over time would be diffused throughout the 32 designated WSAs and would generally have little effect on opportunities for solitude. In some smaller WSAs,

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in WSAs comprised of narrow canyons, and in popular areas where increases could possibly reduce the quality of solitude, wilderness management plans would identify and require the use of visitor management techniques, such as use restrictions, to preserve solitude. The following WSAs may be affected in this way: Fish Creek Canyon, Parunuweap Canyon, Phipps-Death Hollow, Grand Gulch, and Behind the Rocks.

- Areas Not Designated

Solitude would not receive the same degree of protection on the 1,702,804 acres not designated wilderness with this alternative. Most of the nondesignated land would be available for development, as well as for increases in ORV use. In the foreseeable future, loss of solitude resulting directly from surface disturbance would be expected on approximately 48,057 acres within the 51 nondesignated WSAs and the nondesignated portions of 22 WSAs.

Indirect reduction in the quality of solitude, although generally temporary, would involve as many as 481,884 additional acres in the nondesignated areas.

The WSAs where potential disturbance would directly or indirectly affect solitude on more than 20 percent of the WSA include the following: North Stansbury Mountains, Deep Creek Mountains, Rockwell, Swasey Mountains, Moquith Mountain, Wahweap, Fifty Mile Mountain, French Spring-Happy Canyon, Fiddler Butte, Negro Bill Canyon, Devils Canyon, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, Winter Ridge, and Lost Spring Canyon.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce the quality of opportunities for solitude particularly where increased use would be largely vehicular in nature. The WSAs where increased visitor use in the nondesignated area would affect opportunities for solitude are: Cedar Mountain, Moquith Mountain, Paria-Hackberry, The Cockscomb, Fish Creek Canyon, Mule Canyon, Cheesebox Canyon, Negro Bill Canyon, and Devils Canyon.

As with naturalness, the projected loss of solitude in the nondesignated areas is not only based on resource values, but also on the continuation of management policies and objectives, which could

change in time. Because of this, over time there could be a cumulative loss of solitude greater than projected here.

Conclusion: Opportunities for solitude would be preserved overall in the designated areas, which comprise approximately 47 percent of the total acreage in the 83 WSAs. Opportunities for solitude would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, a direct loss of solitude would occur on approximately 48,470 acres, and an additional 519,578 acres. About 99 percent of the loss would be nondesignated areas.

- Primitive and Unconfined Recreation

As with solitude, opportunities for primitive and unconfined recreation would be directly lost due to mineral exploration and development, road and other rights-of-way development, resource development projects, and ORV use. Opportunities would also be indirectly reduced in quality by dust and noise that would occur in the surrounding area during the period of disturbance, and by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of 10 WSAs and parts of 22 WSAs (1,533,030 acres) included in this alternative would protect the primitive and unconfined recreation values in about 47 percent of the acreage in the 83 WSAs. In this alternative, 1,398,420 of the designated acres have outstanding opportunities for primitive and unconfined recreation, and 134,610 acres do not. All of the designated areas have outstanding opportunities for primitive and unconfined recreation.

With this alternative, the potential for disturbance and vehicular activity that would impair opportunities for primitive and unconfined recreation would be eliminated or largely reduced in the designated areas. Still, in the foreseeable future, direct loss of opportunities for primitive recreation would result from approximately 413 acres of surface disturbance in the designated portions of 25 of the 32 WSAs. An indirect reduction in the quality of opportunities for primitive recreation would occur on an additional 37,694 acres. However, in all cases, opportunities for primitive

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and unconfined recreation would be preserved in the designated area as a whole. There are no WSAs that would be designated with this alternative where opportunities for primitive recreation would be administratively difficult to preserve.

Increases in primitive-type visitor use over time would generally have little effect on opportunities for primitive and unconfined recreation. In popular or small designated areas where visitor use increases would reduce opportunities for primitive and unconfined recreation, wilderness management plans would restrict use to preserve opportunities. The WSAs where wilderness management plans would identify and require techniques to control use are the same as identified for solitude.

- Areas Not Designated

Primitive and unconfined recreation values would not receive the same degree of protection on the 1,702,804 acres not designated wilderness with this alternative. Most of the nondesignated areas would be available for development, as well as for increases in ORV use. In the foreseeable future, approximately 48,057 acres of surface disturbance in the nondesignated areas would result in direct loss of opportunities for primitive and unconfined recreation. There would be an additional indirect reduction in the quality of opportunities on 481,884 acres in the nondesignated areas.

The WSAs where potential disturbance would either directly or indirectly affect primitive recreation opportunities on more than 20 percent of the WSA are the same as identified for solitude.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce primitive recreation opportunities, particularly when increased use would be largely vehicular in nature. The WSAs where such use would reduce opportunities for primitive recreation are the same as identified for solitude.

The projected loss of opportunities for primitive and unconfined recreation in the nondesignated area is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of opportunities for primitive and unconfined recreation greater than projected here.

Conclusion: Opportunities for primitive and unconfined recreation would be preserved overall in the designated areas, which comprise approximately 47 percent of the total acreage in the 83 WSAs. Primitive recreation opportunities would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness type uses increase. In the foreseeable future, a direct loss of primitive recreation opportunities would occur on about 48,470 acres, and an indirect reduction in the quality of these opportunities would occur on up to an additional 519,578 acres. About 99 percent of the loss would be in nondesignated areas.

- Special Features

Impacts on special features primarily are caused by surface disturbance and by noise and vandalism which are related to ease or lack of access and the amount of visitation. Generally, special features are more difficult to manage in areas with disturbance, easy access, and high use than in undisturbed, remote areas.

- Areas Designated

Wilderness designation of all of 10 WSAs and parts of 22 WSAs (1,533,030 total acres) would contribute to the preservation of special features which are found in all of these WSAs. The potential for surface disturbance, water diversion, and vehicular activity that would harm special features would be eliminated or largely reduced in the designated areas. The approximately 413 acres of surface disturbance projected to occur in the designated areas in the foreseeable future would directly affect much less than 1 percent of the designated acreage and would be designed to have little affect on special features.

With this alternative, the distribution of special features that are found in the 32 WSAs that would be designated are as follows: 32 WSAs have scenic features, 27 WSAs have historical features, 32 WSAs have ecological features, 32 WSAs have geological features, and 22 WSAs have other special features which include wild horses and/or perennial waters. Approximately 1,481 of 2,246 known cultural sites in the WSAs would be in the designated areas. Of the known cultural sites, 89 are on the National Register, 87 of which would be in designated areas, and approximately 898 are eligible for the National

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Register, 831 of which would be in designated areas.

A total of 1,174,140 acres of Class A scenery would be protected by wilderness designation. This is approximately 67 percent of the high quality scenery of the 83 WSAs under consideration, approximately 35 percent of the high quality scenery on BLM lands in Utah, and an estimated 12 percent of the high quality scenery in the State.

Of the 15 WSAs that have wild and scenic inventory rivers flowing through them, 11 would be designated as least in part, and the rivers would be largely within the designated areas. Wild and scenic inventory rivers would be protected not only by the fact that allowable surface disturbance would be minimal, but also because upstream projects that would require Federal permitting and that would affect water flow through the wilderness would probably not receive approval. This would be the case with rivers in five of the 11 WSAs that would be designated with this alternative: North Escalante Canyons/The Gulch, Crack Canyon, Sids Mountain, Mexican Mountain, and Dirty Devil. All of these have potential for conflicting development upstream. The amount of water in inventory rivers flowing through the other six WSAs that would be designated (Deep Creek Mountains, Paria-Hackberry, Steep Creek, Grand Gulch, Desolation Canyon, and Westwater) would probably not change much even without wilderness designation. This is because headwaters or intermittent streams are involved with minimal potential for development, because of downstream National Park water needs, because of downstream user needs, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

Increases in primitive-type visitor use over time would be diffused throughout the 32 WSAs and would have little affect on special features.

• Areas Not Designated

Special features would not receive the same degree of protection on the 1,702,804 acres not designated wilderness with this alternative. The special features in the 51 WSAs not designated are as follows: 45 WSAs have scenic features, 22 WSAs have historical features, 51 WSAs have ecological features, 47 WSAs have geological features, and 22 WSAs have other special features.

Most of the nondesignated land would be available for development, as well as for increases in ORV use that could disturb special features. In the foreseeable future, projected disturbance of approximately 48,057 acres would affect special features. Some special features (e.g., archaeological values and threatened, endangered, or candidate plant and animals) would continue to be protected by separate laws and policies. However, other special features (e.g., unusual plant or animal communities, geological features, or scenic values) could be lost or reduced in quality by development or ORV use. Unless designated as wild and scenic rivers in the future, inventory rivers in the nondesignated portions of four WSAs (Fiddler Butte, LaVerkin Creek, Deep Creek, and Cheesebox Canyon), would not be protected from dewatering or development. However, neither dewatering nor development is expected in any of these WSAs except for Fiddler Butte where some dewatering is likely due to potential for upstream development.

Increases in visitor use over time would have little affect on special features in most WSAs. The opportunity for increased ORV use to result in increased cultural resource vandalism would be greatest in Fish Creek Canyon, Mule Canyon, and Cheesebox Canyon.

Conclusion: Special features would be preserved overall in the designated areas, which comprise approximately 47 percent of the total acreage in the 83 WSAs. Special features would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness type uses increase. Approximately 44 percent of the wilderness special features found in the 83 WSAs would be protected by wilderness designation with this alternative.

Impacts on Water Uses

The Paramount Wilderness Quality Alternative would designate 32 areas, with 22 of these areas containing a total of 559.5 miles of perennial streams. Nonconsumptive water uses such as recreation, aesthetics, and wildlife would be favored within the wilderness areas. About 159.5 miles of the 719 miles of perennial streams in WSAs would be in areas not designated as wilderness and would be open to future diversions and water consumptive developments.

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Water use upstream of 10 of the 32 WSAs or portions of WSAs that would be designated wilderness would not be affected because they lack perennial streams. In addition, water uses would not be significantly affected in the designated WSAs because maintenance of existing facilities would be allowed and most water developments such as proposed catchments, guzzlers, spring developments etc., could be designed and installed consistent with wilderness protection guidelines.

Overall, 15 proposed livestock reservoirs would be precluded, but this would not have a significant affect on livestock grazing on a Statewide basis. The Paramount Wilderness Quality Alternative would not affect municipal water developments proposed in 2 WSAs that would not be designated wilderness.

Designation of wilderness could hamper proposals or projects that would transfer water rights, consumptively use water upstream of WSAs or otherwise significantly alter flow through 20 designated nonheadwater WSAs with perennial streams as shown in Table 82. This is because changes in use and changes in points of diversion could be protested by the Federal government to maintain the existing water use patterns which now allow instream flow through the wilderness areas. The State Engineer could choose to accept or reject the protest, but the overall effect would be delay or uncertainty in project approvals. In addition, the Federal government could deny rights-of-way or other approvals for projects that would alter water flow through a designated wilderness.

Table 82

Paramount Wilderness Quality
Designated Non-Headwater Areas with Perennial Streams

Deep Creek Mountains	Parunuweap Canyon
Paria-Hackberry	Phipps-Death Hollow
Steep Creek	Scorpion
North Escalante Canyons/The Gulch	Dirty Devil
Little Rockies	Fish Creek Canyon
Dark Canyon	Horseshoe Canyon (North)
Crack Canyon	Muddy Creek
Sids Mountain	Mexican Mountain
Desolation Canyon	Turtle Canyon
Floy Canyon	Westwater Canyon

Source: WSA Analysis

Of the 20 designated nonheadwater areas with perennial streams, four (Parunuweap Canyon, Horseshoe Canyon [North], Desolation Canyon [Green River], and

Westwater Canyon) are on the Virgin, Green, or Colorado Rivers upstream of the Zion or Canyonlands National Parks. Wilderness would not add appreciably to existing constraints on development of these rivers which include releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the lower Colorado River Basin states, and consideration of water needs for endangered fish species.

Ten of the 20 nonheadwater WSAs with perennial streams (Deep Creek Mountains, Paria-Hackberry, Phipps-Death Hollow, Steep Creek, Scorpion, Little Rockies, Fish Creek Canyon, Dark Canyon, Turtle Canyon, and Floy Canyon) have perennial streams that originate only a short distance above the WSA or are part of small drainages without the potential for major water projects upstream of the WSA. Therefore, few impacts, if any, on upstream uses would result from designation of these areas.

Seven designated areas (North Escalante Canyons/The Gulch, Dirty Devil, Crack Canyon, Muddy Creek, Sids Mountain, Mexican Mountain, and Desolation Canyon [Price River]) have perennial streams that originate long distances above the WSAs and flow through areas where major water projects and diversions now occur or are likely in the foreseeable future. The affected drainages would be the Escalante River, Muddy Creek and Dirty Devil, the San Rafael River, and the Price River. Wilderness-related constraints would be placed on new projects that would divert and use water for coal mining and coal-fired electrical power generation in the Garfield, Emery, and Carbon Counties; expansion of irrigation and reservoirs in the Sevier, Wayne, Emery, and Carbon counties; and tar sand development in the Wayne and Garfield counties or on other possible new water consumptive projects.

Conclusion: Nonconsumptive use of water for wilderness purposes would be favored in 22 areas with perennial streams. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 15 of the 32 areas that would be designated with the Paramount Wilderness Quality Alternative. The Paramount Wilderness Quality Alternative would constrain future water diversion and use upstream of seven designated areas in the Sevier, Wayne, Garfield, Emery, and Carbon Counties.

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Impacts on Mineral and Energy Exploration and Production

Implementation of the Paramount Wilderness Quality Alternative would place maximum limitations on potential mineral and energy resource development on 1,533,030 acres in all of 10 and portions of 22 WSAs designated as wilderness as discussed in the All Wilderness Alternative. The remaining 1,702,804 acres in 5.1 and portions of 22 WSAs would remain open to mineral and energy development subject to the BLM land management plan guidance as discussed in the No Action/No Wilderness Alternative.

- Leasable Mineral Production

- Areas Designated

In the areas designated as wilderness, all 1,533,030 acres would be closed to oil and gas leasing. However, existing pre-FLPMA oil and gas leases on 8,554 acres located within the designated portions of three WSAs (North Escalante Canyons/The Gulch, Phipps-Death Hollow, and Desolation Canyon) could be explored and developed per stipulations attached at the time of lease issuance. BLM projects that development would occur in only two WSAs (Phipps-Death Hollow, Desolation Canyon). These are the WSAs with the highest potential for oil and gas exploration and development. That portion of the carbon dioxide resource under pre-FLPMA lease in the Phipps-Death Hollow WSA also could be developed.

Exploration and development of existing post-FLPMA leases on 101,528 acres in could also occur subject to nonimpairment provisions. However, BLM projects that these leases would expire without any exploration or development activities occurring. Because the remaining

1,422,948 acres in the designated wilderness areas would be closed to leasing, no oil and gas exploration or development would occur in these areas. An undetermined amount of oil and gas could be extracted from designated areas by drilling activities adjacent to designated wilderness boundaries.

The North Escalante Canyons/The Gulch, WSA contains pre-FLPMA oil and gas leases which are under application for conversion to combined hydrocarbon leases. This WSA is located within the Circle Cliffs, STSA. Conversion of existing leases to combined hydrocarbon leases would be neces-

sary before tar sand development could occur. However, once conversion occurred, these leases would become post-FLPMA leases and, therefore, subject to wilderness nonimpairment standards. Because it would be very difficult for tar sand development to meet the nonimpairment requirements, it is projected that the leases under combined hydrocarbon lease conversion application would not be developed. No new competitive leasing for tar sand in the designated portions of the WSAs would be allowed. Overall, about 45 million barrels of in-place tar sand resource would be foregone. Since this would be less than 1 percent of the total estimated 28 billion barrels of in-place tar sand resource in Utah, it would not be significant in the long-term future. It should be further noted, that development of the tar sand resource would be dependent on improved future technologies. Therefore, wilderness designation would not, at present, be the only limitation on full extraction of the tar sand resource.

No coal leases or PRLAs are located within the designated portions of the WSAs. New coal leasing would not be allowed following wilderness designation. Portions of four WSAs (Fifty Mile Mountain, Mt. Ellen-Blue Hills, Desolation Canyon, Turtle Canyon) that have coal development possibilities would be designated wilderness. The coal resources within these areas would be foregone once designation occurs. However, the majority of the coal resource found in the WSAs is located in the nondesignated areas with this alternative. Therefore, the amount of coal foregone would not be significant on a statewide basis.

- Areas Not Designated

In the nondesignated portions of the WSAs, approximately 1,668,507 acres would remain open to oil and gas leasing as discussed in the No Action/No Wilderness Alternative. Production of natural gas would continue to occur in the Jack Canyon, Desolation Canyon, and Winter Ridge WSAs. In addition, oil and gas exploration and possibly development is projected for the nondesignated portions of the Turtle Canyon, Floy Canyon, and the Coal Canyon, Spruce Canyon, and Flume Canyon WSAs. Approximately 34,297 acres would remain closed to leasing. Exploration activities could eventually occur in several other WSAs not designated as Wilderness (see Appendix 6).

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BLM projects that exploration and eventual development of the coal resource would occur in six WSAs (not designated wilderness) and the nondesignated portions of four other WSAs. Exploration and development would occur as discussed in the No Action/No Wilderness Alternative. The majority of development would occur on the Kaiparowits Plateau. Lesser amounts of coal would also be produced from the nondesignated portions of the Mt. Ellen-Blue Hills, Desolation Canyon, and Turtle Canyon WSAs.

No development of the oil shale resource, potash, phosphate, or any other leasable minerals are projected to occur in either the designated or nondesignated portions of any of the WSAs in the foreseeable future. No development of the geothermal or hydropower resource is projected. Therefore, significant amounts of these resources would not be foregone with implementation of the Paramount Wilderness Quality Alternative.

Conclusion: With the Paramount Wilderness Quality Alternative, oil and gas resources projected to be developed in all or part of three WSAs would be foregone with the exception of portions of one WSA which contains pre-FLPMA leases. Development of the tar sand and coal resource would not be foregone as the majority of the areas where these resources are projected to be developed are located in the nondesignated portions of the WSAs. No development of any other leasable mineral or energy resources is projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

- Locatable Mineral Production

- Areas Designated

All 1,533,030 acres within the designated portions would be withdrawn from locatable mineral entry. However, development work, extraction, and patenting would be allowed to continue on 2,977 existing mining claims (59,540 acres) and any future mining claims located prior to wilderness designation. Copper and vein type silver and gold would be explored for and possibly developed from the North Stansbury Mountains, Deep Creek Mountains, and Little Rockies WSAs. Uranium and vanadium production is projected for the Little Rockies, Horseshoe Canyon (North), San Rafael Reef, Crack Canyon, Muddy Creek, Sids Moun-

tain, and Mexican Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to six additional WSAs (see Appendix 6).

Exploration and development activities would be restricted to valid mining claims existing at the time of designation. Any locatable minerals located within the designated wilderness areas, but not under valid mining claim, could not be developed with this alternative and locally significant amounts of gold, silver, copper, uranium and vanadium would be foregone. However, based on existing data, loss of locatable minerals would not be significant on a Statewide or national basis. It is not projected that significant amounts of any other locatable minerals would be foregone with this alternative.

- Areas Not Designated

Locatable mineral exploration and development would be possible on the 1,451,454 acres not designated wilderness with this alternative. No wilderness constraints would be placed on locatable minerals in these areas. Therefore, exploration and development could occur as discussed in the No Action/No Wilderness Alternative. Some 81,576 acres would remain closed to mineral entry as discussed in the No Action/No Wilderness Alternative.

Conclusion: Exploration and/or development of mining claims would occur on 23 WSAs. Wilderness designation would limit activities to existing mining claims in 15 of the 23 WSAs. In designated areas locatable minerals would be foregone however, this would not be significant on a State wide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

Impacts on Local Economic Conditions

The Paramount Wilderness Quality Alternative includes 1,533,030 acres in WSAs where wilderness designation could affect economic development. There would be 1,702,804 acres in WSAs that would not be designated wilderness where existing socioeconomic factors would continue.

- Local Employment

With the Paramount Wilderness Quality Alternative, the predicted baseline for population and employment

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would not be affected (see Chapter 3). While existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8).

• Areas Designated

Existing employment would continue; however, the potential for new development and new employment would be foregone for most minerals and new livestock activities that might otherwise occur in the designated areas. For the WSAs designated as wilderness, the only increases in employment would be new mineral activities allowed under prior existing rights and new commercial recreation activities.

Increased recreation use could occur, with additional employment attributed to commercial outfitters, particularly in some of those WSAs that now receive substantial amounts of tourism-related use, such as the Desolation Canyon, Westwater, Grand Gulch, and North Escalante/The Gulch WSAs. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals.

• Areas Not Designated

With this alternative, the existing activities would continue within 70 WSAs and not designated portions of eight WSAs. Employment related to activities in the nondesignated areas involves portions of a small number of existing jobs.

In addition, the projected activities for all or parts of the 73 areas not designated wilderness would occur. This would include mineral exploration, mineral development, increases in livestock grazing, additional commercial recreation, and in many WSAs, no new activities. These projected actions are estimated to result in a small gradual increase in local employment within the foreseeable future. Many of these future jobs (those associated with mineral exploration) would be temporary within the WSAs. Most of the recreation jobs would be seasonal.

In the long term, potential mineral development in WSAs not designated could lead to creation of new jobs, if the technology and/or markets associated with coal and tar sand were to improve. In the

long term, extraction of bitumen from tar sand in the Fiddler Butte, French Spring-Happy Canyon, and Winter Ridge WSAs would substantially increase employment in the eastern Emery, Wayne, and Uintah Counties. Likewise, in the long term, production of large amounts of coal from the WSAs in the Kaiparowits region would substantially increase employment in the Garfield and Kane counties. Continued extraction of oil and gas from the Winter Ridge, part of the Desolation Canyon, Jack Canyon, and portions of other WSAs in the Book Cliffs region would tend to stabilize and possibly increase related employment in the Uintah, eastern Emery, and northern Grand Counties.

Increasing emphasis on tourism and related employment in Utah would continue and would involve recreation uses within some of the WSAs not designated, such as hunting guide services in Spruce and Flume Canyon WSAs.

Conclusion: Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant to any of the MCDs or local communities; except for the long-term potential for future extraction of large quantities of tar sand and Kaiparowits coal, should it occur. The employment impacts for this alternative essentially would be the same as with the BLM Proposed Action Alternative.

• Local Sales

The Paramount Wilderness Quality Alternative would continue the local sales patterns relative to existing activities within the WSAs.

Continued existing activities and increases in mineral activities, recreation and livestock grazing with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A portion of the wages associated with the existing and future jobs in the WSAs would be returned to the local economy. Assuming each job at the annual average Utah wage rate of about \$12,000 per capita, this would contribute a small increase to the economy, widely dispersed primarily in the Southwest, Central and Southeast MCDs. A multiplier effect would further disperse a portion of these wages within the local economy. Any major capital expenditures attributed to future mineral exploration, mining, or oil and gas extraction in nondesignated WSAs likely would occur outside of the WSA localities.

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Conclusion: Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) change would occur in localities immediately adjacent to the WSAs not designated as wilderness and having predicted long-term potential for major tar sand and coal projects. The magnitude of such impacts would be similar to the BLM Proposed Action Alternative.

- Federal Revenues and Returns to the Local Economy

Federal revenues from existing and additional leasing in WSAs would continue to be a small portion of the Statewide total. Those from livestock grazing in WSAs would continue generally at existing levels and increases would be possible in the nondesignated areas. Revenues from existing commercial recreation would continue and would increase consistent with normal baseline growth patterns. None of the increases in revenues would exceed the 5 percent significance standard, unless major mineral development were to occur in the long term in WSAs not designated as wilderness.

- Areas Designated

In areas proposed for wilderness designation, existing revenues from livestock grazing would continue. Mineral revenues from leases held by production or with other prior rights would continue. A small increase in commercial recreation fees is predicted. Potential annual revenues of about \$1.7 million from speculative oil and gas leases and \$1,334 from potential increases in livestock AUM production and fees would be foregone.

- Areas Not Designated

With the Paramount Wilderness Quality Alternative, about 60 percent of the existing government revenues is attributed to areas not proposed for designation. These would continue. In addition, it is assumed that up to 1,685,507 acres within WSAs would be made available to new speculative oil and gas leasing and, with an estimated 80 percent under lease at any one time and a minimum lease rate of \$2 per acre, this could result in up to about \$2.7 million per year in Federal revenue. Generally, 50 percent of this increase would be transferred to the State, and a variable part of the State share would be forwarded to local entities.

Also, in the areas not proposed, it is estimated that increases in livestock grazing of 2,542 AUMs within the WSAs would add about \$3,915 per year to Federal revenues, and increases in commercial recreation would result in about \$4,000 per year in Federal revenues. Parts of the grazing fees and the commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy.

Conclusion: Federal revenues would increase by up to \$2.7 million per year primarily due to speculative oil and gas leasing.

CLUSTER AND INTERAGENCY AREAS ALTERNATIVE

Impacts on Wilderness Values

- Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

- Areas Designated

Wilderness designation of all of 53 WSAs (2,486,732 total acres) included in this alternative would protect naturalness values on about 77 percent of the acreage in the 83 WSAs. All designated acres in this alternative meet the Wilderness Act criteria for naturalness.

With this alternative, management of the designated areas according to the wilderness management policy largely would remove the potential for future surface disturbance that would reduce naturalness. Complete preservation of naturalness is anticipated in the designated portions of 21 of the 53 WSAs. Although protected, complete preservation of naturalness in the remaining 32 designated WSAs is not anticipated, largely due to the existence of valid existing rights. In the foreseeable future, naturalness values in the designated portion of these WSAs would be directly lost on approximately 807 acres due to surface disturbance. The disturbance would be due to mineral-related activities, providing access to State in-holdings, and development of rangeland projects. There would be an additional perceived loss of

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naturalness in the area surrounding the disturbance. However, naturalness values would be preserved in the designated area as a whole in all cases. In the Mt. Ellen-Blue Hills and Mt. Pennell WSAs, it would be administratively difficult to preserve naturalness throughout all the designated acreage because of existing campgrounds inside the designated areas.

- Areas Not Designated

Naturalness values would not receive the same degree of protection on the 749,102 acres not designated wilderness with this alternative. The potential for surface disturbance would be somewhat limited in some areas because of inaccessible terrain or because of management restrictions identified in land use plans. For example, mining claim withdrawals would continue on 67,062 acres; oil and gas leasing Category 3 or 4 designations, which allow for no surface occupancy or no leasing, respectively, would continue on 166,880 acres; ORV closures or restrictions would continue on 150,725 acres; and VRM Class II designation, which allows for nonevident man-made change, would continue on 328,343 acres. Most of the nondesignated land would, however, be available for development, as well as for increases in ORV use.

In the foreseeable future, direct loss of naturalness would be expected from disturbance on approximately 12,588 acres within the 30 nondesignated WSAs. The disturbance would be due to such activities as mineral exploration and development, providing access to State in-holdings, rangeland projects, vegetation treatments, ORV activity, community expansion, campground construction, and development of rights-of-way.

Loss of naturalness would be indirectly perceived in the surrounding areas as well as in the directly disturbed areas. In most WSAs, the areas of perceived loss would be in isolated portions of the unit and would not affect naturalness in the nondesignated area as a whole. The WSAs where the loss of naturalness would be perceived throughout much of the nondesignated area are: French Spring-Happy Canyon and Winter Ridge.

The projected loss of naturalness in the nondesignated areas is not only based on resource values, but also on the continuation of present manage-

ment policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of naturalness greater than projected here.

Conclusion: Naturalness Values would be preserved overall in the designated areas, which comprise about 77 percent of the total acreage in the 83 WSAs. Naturalness values would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions increase. In the foreseeable future, a direct loss of naturalness would occur on an estimated 13,395 acres. About 94 percent of the loss would be in nondesignated areas.

- Solitude

In general, opportunities for solitude would be directly lost due to the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. Opportunities would also be indirectly reduced in quality by such impacts as noise and dust that would occur during the period of development, and by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of 53 WSAs (2,486,732 total acres) included in this alternative would protect the solitude values in about 77 percent of the acreage in the 83 WSAs. A total of 1,851,535 acres of the designated acres in this alternative have outstanding opportunities for solitude and 635,197 acres do not.

With this alternative, the potential for development and vehicular activity that would impair solitude would be eliminated or largely reduced in the designated areas. Complete preservation of solitude is anticipated in the designated portions of 21 of the 53 WSAs. Although protected, complete preservation of solitude in the designated portions of the remaining 32 designated WSAs is not anticipated, due to the same reasons identified in the analysis for naturalness. In the foreseeable future, solitude values in the designated portion of these WSAs would be directly lost on approximately 807 acres and indirectly reduced in quality on an additional 108,758 acres. Solitude would be preserved in the designated area as a

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whole in all cases. In the Mt. Ellen-Blue Hills and Mt. Pennell WSAs, it would be administratively difficult to preserve solitude throughout all the designated acreage because of campgrounds in the designated areas.

Increases in visitor use over time would be diffused throughout the 53 WSAs, would be primitive in nature, and generally would have little affect on opportunities for solitude. In WSAs comprised of narrow canyons, and in popular areas where increases could possibly reduce the quality of solitude, wilderness management plans would identify and require the use of visitor management techniques, such as use scheduling, to preserve solitude. The following WSAs may be affected in this way: Parunuweap Canyon, Phipps-Death Hollow, Grand Gulch, and Fish Creek Canyon.

- Areas Not Designated

Solitude would not receive the same degree of protection on the 749,102 acres not designated wilderness with this alternative. Most of the nondesignated land would be available for development, as well as for increases in ORV use. In the foreseeable future, loss of solitude resulting directly from surface disturbance would be expected on approximately 12,588 acres within the 30 nondesignated WSAs.

Indirect reduction in the quality of solitude, although generally temporary, would involve as many as 121,840 additional acres in the nondesignated areas. WSAs where potential disturbance would directly or indirectly affect solitude on more than 20 percent of the WSA include the following: North Stansbury Mountains, Rockwell, Swasey Mountains, Moquith Mountain, French Spring-Happy Canyon, Negro Bill Canyon, Devils Canyon, Desolation Canyon, and Winter Ridge.

Increases in visitor use over time in the nondesignated portions of some WSAs would reduce the quality of opportunities for solitude particularly where increased use would be largely vehicular in nature. The WSAs where increased visitor use in the nondesignated area would affect opportunities for solitude are: Cedar Mountain, Moquith Mountain, Paria-Hackberry, Devils Canyon, Crack Canyon, Mule Canyon, Cheesebox Canyon, Negro Bill Canyon, Mill Creek Canyon, and Behind The Rocks.

As with naturalness, the projected loss of solitude in the nondesignated areas is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of solitude greater than projected here.

Conclusion: Opportunities for solitude would be preserved overall in the designated areas, which comprise approximately 77 percent of the total acreage in the 83 WSAs. Opportunities for solitude would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and nonwilderness type uses increase. In the foreseeable future, a direct loss of solitude would occur on approximately 13,395 acres, and an indirect reduction in the quality of solitude would occur on up to an additional 230,598 acres. About 94 percent of the loss would be in nondesignated areas.

- Primitive and Unconfined Recreation

As with solitude, opportunities for primitive and unconfined recreation would be directly lost due to mineral exploration and development, road and other rights-of-way development, resource development projects, and vehicle use. Opportunities for primitive and unconfined recreation would also be indirectly reduced in quality by dust and noise that would occur in the surrounding area during the period of disturbance, and by increases in visitor use, particularly use involving vehicular activity.

- Areas Designated

Wilderness designation of all of 53 WSAs (2,486,732 acres) included in this alternative would protect the primitive and unconfined recreation values in about 77 percent of the acreage in the 83 WSAs. In this alternative, 1,684,222 designated acres in 50 WSAs have outstanding opportunities for primitive and unconfined recreation, and 802,505 acres do not. Three of the designated areas (Wahweap, Burning Hills, and Death Ridge) do not have any outstanding opportunities for primitive and unconfined recreation.

With this alternative, the potential for disturbance and vehicular activity that would impair opportunities for primitive and unconfined recreation would be eliminated or largely reduced in the designated areas. Still, in the foreseeable

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future, a direct loss of opportunities for primitive recreation would result from approximately 807 acres of surface disturbance in the designated portions of 32 of the 53 designated WSAs. An indirect reduction in the quality of opportunities for primitive recreation would occur on an additional 108,758 acres. However, opportunities for primitive and unconfined recreation would be preserved in the designated areas as a whole. In the Mt. Ellen-Blue Hills and Mt. Pennell WSAs, it would be administratively difficult to preserve primitive and unconfined recreation values throughout all the designated acreage because of established campgrounds.

Increases in primitive-type visitor use over time would be diffused throughout the 53 designated WSAs and would generally have little effect on opportunities for primitive and unconfined recreation. In popular designated areas where visitor use increases could reduce primitive and unconfined recreation, wilderness management plans would identify visitor management techniques to preserve the quality of the primitive recreation opportunity. The same WSAs identified for solitude may be affected in this way.

• Areas Not Designated

Primitive and unconfined recreation values would not receive the same degree of protection on the 749,102 acres not designated wilderness with this alternative. Most of the nondesignated areas would be available for development, as well as for increases in ORV use. In the foreseeable future, approximately 12,588 acres of surface disturbance in the nondesignated areas would result in direct loss of opportunities for primitive and unconfined recreation. There would be an additional indirect reduction in the quality of opportunities on 121,840 acres in the nondesignated areas.

The WSAs where potential disturbance would either directly or indirectly affect primitive recreation opportunities on more than 20 percent of the WSA are the same as identified for solitude.

Increases in visitor use over time in nondesignated portions of some WSAs would reduce primitive recreation opportunities, particularly where increased use would be largely vehicular in nature. The WSAs where such use would significant-

ly reduce opportunities for primitive recreation are the same as identified for solitude.

The projected loss of opportunities for primitive and unconfined recreation in the nondesignated area is not only based on resource values, but also on the continuation of management policies and objectives, which could change in time. Because of this, over time there could be a cumulative loss of opportunities for primitive and unconfined recreation greater than projected here.

Conclusion: Opportunities for primitive and unconfined recreation would be preserved overall in the designated areas, which comprise approximately 77 percent of the total acreage in the 83 WSAs. Primitive recreation opportunities would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur on about 13,395 acres, and an indirect reduction in the quality of these opportunities would occur on up to an additional 230,598 acres. About 94 percent of the loss would be in nondesignated areas.

• Special Features

Impacts on special features primarily are caused by surface disturbance, and by noise and vandalism which are related to ease or lack of access and the amount of visitation. Generally, special features are more difficult to manage in areas with disturbance, easy access, and high use than in undisturbed, remote areas.

• Areas Designated

Wilderness designation of all of 53 WSAs (2,486,732 total acres) would contribute to the preservation of special features which are found in all of these WSAs. The potential for surface disturbance, water diversion, and vehicular activity that would harm special features would be eliminated or largely reduced in the designated areas.

Approximately 807 acres of surface disturbance projected to occur in the designated areas in the foreseeable future would affect much less than 1 percent of the designated acreage, and would be designed to have little affect on special features.

With this alternative, the distribution of special features that are found in the 53 WSAs that would be designated are as follows: 52 WSAs

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have scenic features, 32 WSAs have historical features, 53 WSAs have ecological features, 53 WSAs have geological features, and 31 WSAs have other special features which include wild horses and/or perennial waters. Approximately 1,887 of 2,246 known cultural sites (historical special features) in the WSAs would be in the designated areas. Of the known cultural sites, 89 are on the National Register, all of which would be in designated areas, and approximately 898 are eligible for the National Register, 883 of which would be in designated areas.

A total of 1,506,149 acres of Class A scenery would be protected by wilderness designation. This is approximately 85 percent of the high quality scenery of the 83 WSAs under consideration, approximately 44 percent of the high quality scenery on BLM lands in Utah, and an estimated 15 percent of the high quality scenery in the State.

Of the 15 WSAs that have wild and scenic inventory rivers flowing through them, 12 WSAs would be designated at least in part, and the rivers would be largely within the designated areas. Wild and scenic inventory rivers would be protected not only by the fact that allowable surface disturbance would be minimal, but also because upstream projects that would require Federal permitting and that would affect water flow through the wilderness would probably not receive approval. This would be the case with rivers in five of the 53 WSAs that would be designated with this alternative (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Sids Mountain, and Mexican Mountain). All of these have potential for conflicting development upstream. The amount of water in inventory rivers flowing through the other seven WSAs that would be designated (Deep Creek Mountains, LaVerkin Creek, Deep Creek, Paria-Hackberry, Grand Gulch, Desolation Canyon, and Westwater) would probably not change much even without wilderness designation. This is because headwaters or intermittent streams are involved with minimal potential for development, or because of downstream National Park water needs, or because of downstream user needs, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

Increases in visitor use over time would be primitive in nature and diffused throughout the 53

WSAs, therefore, having little effect on special features in the designated areas.

• Areas Not Designated

Special features would not receive the same degree of protection on the 749,102 acres not designated wilderness with this alternative. The special features in the 30 WSAs not designated are as follows: 25 WSAs have scenic features, 17 WSAs have historical features, 30 WSAs have ecological features, 27 WSAs have geological features, and 13 WSAs have other special features.

Most of the nondesignated land would be available for development, as well as for increases in ORV use that could disturb special features. In the foreseeable future, projected disturbance of approximately 12,588 acres could affect special features. Some special features (e.g., archaeological values and threatened, endangered, or candidate plants and animals) would continue to be protected by separate laws and policies. However, other special features (e.g., unusual plant or animal communities, geological features, or scenic values) could be lost or reduced in quality by development or ORV use. Unless designated as wild and scenic rivers in the future, inventory rivers in three nondesignated WSAs (Cheesebox Canyon, Steep Creek, and Crack Canyon) would not be protected from dewatering or development. However, it is unlikely that there would be projects in the future that would affect the river segments in Cheesebox Canyon and Steep Creek WSAs. Some dewatering within the Crack Canyon WSA is likely due to the potential for upstream development.

Increases in visitor use over time would generally have little affect on special features. Increased vehicular use could result in cultural vandalism particularly in Mule Canyon and Cheesebox Canyon WSAs.

Conclusion: Special features would be preserved overall in the designated areas, which comprise approximately 77 percent of the total acreage in the 83 WSAs. Special features would not be protected by wilderness designation in the remaining acreage, and loss in these areas would occur as intrusions and non-wilderness type uses increase. Approximately 66 percent of the wilderness special features found in the

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83 WSAs would be protected by wilderness designation with this alternative.

Impacts on Water Uses

The Cluster and Interagency Areas Alternative would designate 53 areas, with 31 of these areas containing a total of 622.5 miles of perennial streams. Nonconsumptive water uses such as recreation, aesthetics, and wildlife would be favored within the wilderness areas. About 96.5 miles of the 719 miles of perennial streams in WSAs would be in areas not designated as wilderness and would be open to future diversions and water consumptive developments.

Water use upstream of 22 of the 53 WSAs or portions of WSAs that would be designated wilderness would not be affected because they lack perennial streams. In addition, water uses would not be significantly affected in the designated WSAs because maintenance of existing facilities would be allowed and most water developments such as proposed catchments, guzzlers, spring developments, etc., could be designed and installed consistent with wilderness protection guidelines.

Overall, 41 proposed livestock reservoirs would be precluded, but this would not have a significant affect on livestock grazing on a Statewide basis. The Cluster and Interagency Areas Alternative would prevent a municipal water development proposed by the town of Kannarraville in the Spring Creek Canyon WSA.

Designation of wilderness could complicate proposals or projects that would consumptively use water upstream of WSAs or otherwise significantly alter flow through 24 designated nonheadwater WSAs with perennial streams, as shown in Table 83. This is because changes in use or changes in points of diversion could be protested by the Federal government to maintain the existing water use patterns which now allow in-stream flow through the wilderness areas. The State Engineer could choose to accept or reject the protest, but the overall effect would be delay or uncertainty in project approvals. In addition, the Federal government could deny rights-of-way or other approvals for projects that would alter water flow through designated wilderness.

Seven of the 24 designated nonheadwater areas with perennial streams (Deep Creek Canyon, North Fork Virgin River, Parunuweap Canyon, Horseshoe Canyon [North], Desolation Canyon [Green River], Westwater

Canyon, and Spring Creek Canyon) are on the Virgin, Green, or Colorado rivers upstream of the Zion or Canyonlands National Parks. Wilderness would not add appreciably to existing constraints on development of these rivers which include releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the lower Colorado River Basin states, and consideration of water needs for endangered fish species.

Table 83
Cluster and Interagency Areas
Designated NonHeadwater Areas with Perennial Streams

Deep Creek Mountains	Deep Creek
North Fork Virgin River	Parunuweap
Paria-Hackberry	The Cockscomb
Phipps-Death Hollow	Scorpion
North Escalante Canyons/The Gulch	Dirty Devil
Fiddler Butte	Fish Creek Canyon
Dark Canyon	Indian Creek
Horseshoe Canyon (North)	Sids Mountain
Mexican Mountain	Desolation Canyon
Turtle Canyon	Floy Canyon
Westwater Canyon	Spring Creek Canyon
Fremont Gorge	Devils Canyon

Source: WSA Analysis

Twelve of the 24 nonheadwater WSAs with perennial streams (Deep Creek Mountains, Paria-Hackberry, The Cockscomb, Phipps-Death Hollow, Scorpion, Fish Creek Canyon, Dark Canyon, Indian Creek, Mill Creek, Turtle Canyon, Floy Canyon, and Daniels Canyon) have perennial streams that originate only a short distance above the WSA or are part of small drainages without the potential for major water projects upstream of the WSA. Therefore, few impacts, if any, on upstream uses would result from designation of these areas.

Seven designated areas (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Sids Mountain, Mexican Mountain, Desolation Canyon [Price River], and Fremont Gorge) have perennial streams that originate long distances above the WSAs and flow through areas where major water projects and diversions now occur or are likely in the foreseeable future. The affected drainages would be the Escalante River, Muddy Creek and Dirty Devil, the San Rafael River, and the Price River. Wilderness-related constraints would be placed on new projects that would divert and use water for coal mining and coal-fired electrical power generation in the Garfield, Emery, and Carbon Counties; expansion of irrigation and reservoirs in the Sevier, Wayne, Emery, and Carbon

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Counties; and tar sand development in the Wayne and Garfield Counties or on other possible new water consumptive projects.

Conclusion: Nonconsumptive use of water for wilderness purposes would be favored in 31 areas with perennial streams. Development of a proposed municipal water source would be precluded in one wilderness area. Water uses upstream of wilderness would not be significantly affected by wilderness designation of 46 of the 53 areas that would be designated with the Cluster and Interagency Areas Alternative. This alternative would constrain future water diversion and use upstream from seven designated areas in Sevier, Wayne, Garfield, Emery, and Carbon Counties.

Impacts on Mineral and Energy Exploration and Production

Implementation of the Cluster and Interagency Areas Alternative would place maximum limitations on potential mineral and energy resource development on 2,486,732 acres in 53 WSAs designated as wilderness as discussed in the All Wilderness Alternative. The remaining 749,102 acres in 30 WSAs would remain open to mineral and energy development subject to BLM land management plan guidance as discussed in the No Action/No Wilderness Alternative.

- Leasable Mineral Production

- Areas Designated

In the areas designated as wilderness, all 2,486,732 acres would be closed to oil and gas leasing. However, existing pre-FLPMA oil and gas leases on 49,878 acres located within the designated portions of 9 WSAs (Death Ridge, North Escalante Canyons/The Gulch, Phipps-Death Hollow, Fiddler Butte, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon) could be explored and developed per stipulations attached at the time of lease issuance. BLM projects that development would occur in only 6 WSAs (Phipps-Death Hollow, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon). These are the WSAs with the highest potential for oil and gas exploration and development. That portion of the carbon dioxide resource under pre-FLPMA lease in the Phipps-Death Hollow WSA also could be developed.

Exploration and development of existing post-FLPMA leases on 148,505 acres could also occur subject to nonimpairment provisions. However, BLM projects that these leases would expire without any exploration or development activities occurring. Because the remaining 2,288,349 acres in the designated wilderness areas also would be closed to leasing, no oil and gas exploration or development would occur in these areas. An undetermined amount of oil and gas could be extracted from designated areas by drilling activities adjacent to designated wilderness boundaries.

The North Escalante Canyons/The Gulch and, Fiddler Butte WSAs contain pre-FLPMA oil and gas leases which are under application for conversion to combined hydrocarbon leases. Portions of these WSAs are located within the Circle Cliffs and Tar Sand Triangle STSAs. Conversion of existing leases to combined hydrocarbon leases would be necessary before tar sand development could occur. However, once conversion occurred, these leases would become post-FLPMA leases and, therefore, subject to wilderness nonimpairment standards. Because it would be very difficult for tar sand development to meet the nonimpairment requirements, it is projected that the leases under combined hydrocarbon lease conversion application would not be developed. No new competitive leasing for tar sand in the designated portions of the WSAs would be allowed. Overall, about 253.5 million barrels of in-place tar sand resource would be foregone. Since this would be less than one percent of the total estimated 28 billion barrels of in-place tar sand resource in Utah, it would not be significant in the long-term future. It should be further noted, that development of the tar sand resource would be dependent on improved future technologies; therefore, wilderness designation would not, at present, be the only limitation on full extraction of the tar sand resource.

The 57,474 acres of coal leases and 22,964 acres of PRLAs located within the designated portions of the WSAs would expire and would not be reissued unless diligent development requirements are met prior to expiration. New coal leasing would not be allowed. With this alternative, an estimated 4 billion short tons of in-place resource would be foregone. This represents

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approximately 13 percent of the total in-place coal resource within the State of Utah.

- Areas Not Designated

In the nondesignated portions of the WSAs, approximately 666,641 acres would remain open to oil and gas leasing as discussed in the No Action/No Wilderness Alternative. Production of natural gas would continue to occur in the Winter Ridge WSA. In addition, oil and gas exploration and possibly development is projected for Behind the Rocks WSA. Exploration activities could eventually occur in several other WSAs not designated as wilderness (see Appendix 6). Some 82,461 acres would remain closed to mineral leasing.

BLM estimates that exploration and eventual development of the coal resource would occur in three WSAs (not designated wilderness). Exploration and development would occur as discussed in the No Action/No Wilderness Alternative. The development would occur on the Kaiparowits Plateau.

No development of the oil shale resource, potash, phosphate, or any other leasable minerals are projected to occur in either the designated or nondesignated portions of any of the WSAs in the foreseeable future. No development of the geothermal or hydropower resource is projected. Therefore, significant amounts of these resources would not be foregone with implementation of the Cluster and Interagency Areas Alternative.

Conclusion: With the Cluster and Interagency Areas Alternative, oil and gas resources projected to be explored or developed in all or part of 20 WSAs would be foregone with the exception of portions of nine WSAs which contain 49,878 acres of pre-FLPMA leases. Development of a significant amount of coal resource would be foregone because seven of 10 WSAs where coal development is projected would be designated wilderness. Tar sand development would be foregone in one of the three WSAs where development is projected. No development of any other leasable mineral or energy resources is projected and, therefore, would not be foregone with this alternative. Leasable mineral and energy resource exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

- Locatable Mineral Production

- Areas Designated

All 2,486,732 acres within the designated portions would be withdrawn from locatable mineral entry. However, development work, extraction, and patenting would be allowed to continue on 3,107 existing mining claims (62,140 acres) and any future mining claims located prior to wilderness designation. Copper and vein type silver and gold would be explored for and possibly developed from North Stansbury Mountains, Deep Creek Mountains, Mt. Pennell, and Little Rockies WSAs. Uranium and vanadium production is projected from Little Rockies, Horseshoe Canyon (North), San Rafael Reef, Sids Mountain, and Mexican Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to 5 additional WSAs (see Appendix 6).

Exploration and development activities would be restricted to valid mining claims, existing at the time of designation. Any locatable minerals located within the designated wilderness areas but not under valid mining claim could not be developed. However, based on existing data, loss of locatable minerals would not be significant on a State-wide or national basis. It is not projected that significant amounts of any other locatable minerals would be foregone with this alternative.

- Areas Not Designated

Locatable mineral exploration and development would be possible on the 682,040 nondesignated acres with this alternative. No wilderness constraints would be placed on locatable minerals in these areas, therefore, exploration and development could occur as discussed in the No Action/No Wilderness Alternative.

Conclusion: Exploration and/or development of mining claims would occur on 23 WSAs. Wilderness designation would limit activities to existing mining claims in 14 of the 23 WSAs. In designated areas locatable minerals would be foregone however, this would not be significant on a Statewide or national basis. Locatable mineral exploration and production would not be adversely affected in the nondesignated portions of the WSAs.

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Impacts on Local Economic Conditions

The Cluster and Interagency Areas Alternative includes 2,486,732 acres in WSAs where wilderness designation would occur. There would be 749,102 acres in WSAs that would not be designated wilderness where existing socioeconomic factors would continue. This alternative also recognizes 1,363,674 acres of designated or administratively endorsed wilderness on adjacent lands managed by the FS or the NPS. Socioeconomic impacts from these adjacent lands are indirectly included in the analysis of this alternative as they may relate to extended tours by commercial outfitters using both BLM and the adjacent areas. Other considerations concerning the adjacent lands are not included because the management by the other Federal agencies is not dependent on the outcome of the BLM wilderness review process.

As noted in the description of this alternative, a primary objective for this alternative was to consider whether or not large blocks of wilderness would result in notable increases in commercial outfitting and encourage increased tourist-oriented economic growth in nearby local communities. The EIS analysis for this alternative addresses predicted economic aspects that may be associated with large blocks, or clusters of designated wilderness. The focus is to address the question of whether or not (and to the extent possible, how much) wilderness designation can provide economic (financial) growth in local counties and communities.

Generally, it is concluded that most economic growth related to tourism is keyed to resorts and developed attractions. The economic future of the West during the 1990s is expected to show a major switch from traditional activities (mining, timber, and agriculture) to an "attraction" economy built around tourism, based on an expensive and expanding infrastructure (Reid, 1990).

• Local Employment

With the Cluster and Interagency Areas Alternative, the predicted baseline for population and employment would not be affected (see Chapter 3). While existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8).

• Areas Designated

Existing employment would continue; however, the potential for new development and new employment would be foregone for most minerals and new livestock activities that might otherwise occur in the designated areas. For the WSAs designated as wilderness, the only increases in employment would be new mineral activities allowed under prior existing rights and new commercial recreation activities . . . Extraction of oil and gas from part of the Desolation Canyon, Jack Canyon, and portions of other WSAs in the Book Cliffs region would be foregone and the possible future related employment in the Uintah, eastern Emery, and northern Grand counties would not occur. This alternative would preclude the long-term option of major developments for extraction of coal from WSAs in Kaiparowits region.

Also it would limit future opportunities for substantial developments in the Tar Sand Triangle and the Circle Cliffs STSAs.

Increased recreation use could occur with additional employment attributed to commercial outfitters, particularly in some of those WSAs that now receive substantial amounts of tourism-related use. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals.

An expanded effort to publicize wilderness outfitter tours could generate additional employment for recreation reservation businesses and guides. However, over the long term this may not exceed that which would occur without designation. Experiences with Forest Service wilderness areas indicate that the added publicity a particular area receives as a result of wilderness designation may lead to a short-term (3 to 5 year) surge in recreational use, subsequently visitation drops back to baseline trends as the initial effect wears off (Centaur, 1979).

Opportunities for new commercial outfitters and increases in outfitter income would be preserved. In certain locations, such as the Book Cliffs, Henry Mountains, and Dark Canyon-Cedar Mesa, there are opportunities for increased commercial recreation. However, in other locations such as the Desolation Canyon and Westwater WSAs,

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there is little chance for increased use due to the already high levels of use and the current permitting requirements to prevent loss of resource values and recreation experience quality.

Wilderness designation is not expected to result in major increases in economic activity and population. Therefore, the local, public, and private infrastructure is unlikely to be affected by wilderness designation (Centaur, 1979).

• Areas Not Designated

With this alternative, the existing activities would continue within all 30 WSAs not designated.

The nonwilderness activities for all or parts of the 30 areas not designated wilderness would occur. This would include mineral exploration, mineral development and increases in livestock grazing. Many existing and future jobs (those associated with mineral exploration) would be temporary and/or seasonal.

In the long term, potential mineral development in several of the WSAs not designated could lead to creation of new jobs, if the technology and/or markets associated with coal and tar sand were to improve. In the long term, extraction of bitumen from tar sand in the French Spring-Happy Canyon, and Winter Ridge WSAs would substantially increase employment in the eastern Emery, Wayne, and Uintah counties. Likewise in the long term, production of coal from the Carcass Canyon WSA in the Kaiparowits region would increase employment a small amount in Garfield and Kane Counties.

Increasing emphasis on tourism and related employment in Utah would continue and would involve recreation uses within some of the WSAs not designated, such as Moquith Mountain and Behind the Rocks.

Conclusion: Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment related to both the nondesignated and designated acreages of the WSAs would not be significant to any of the MCDs or local communities. It is concluded that large clusters or blocks of wilderness would encourage some increases in seasonal commercial recreation employment, but use within the WSAs would not be enough to result in substantial new tour-

ism infrastructure and economic growth in local communities.

• Local Sales

The Cluster and Interagency Areas Alternative would continue the local sales patterns relative to existing activities within the WSAs.

Continuation of existing activities and increases in mineral activities, recreation, and livestock grazing with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A substantial portion of the wages associated with the existing and future jobs in the WSAs would be returned to the local economy. Assuming each job at the annual average Utah wage rate of about \$12,000 per capita, this would contribute small increases to the economy, widely dispersed primarily in the Southwest and Southeast MCDs. A multiplier effect would further disperse a portion of these wages within the local economy. Any major capital expenditures attributed to future mineral exploration, mining, or oil and gas extraction in nondesignated WSAs likely would occur outside of the WSA localities. Opportunities foregone in the long-term future, particularly for coal development, could be significant in the Garfield and Kane counties.

Conclusion: Most existing and future activities within WSAs would continue to have a widely dispersed effect on local sales. None of the increases would be significant (greater than 5 percent). There could be a significant reduction in sales as compared to those that otherwise would occur in Garfield and Kane Counties.

• Federal Revenues and Returns to the Local Economy

Federal revenues from existing and additional leasing in WSAs would continue to be a small portion of the Statewide total. Those from livestock grazing in WSAs would continue generally at existing levels, and increases would be precluded in the designated areas. Revenues from existing commercial recreation would continue and would increase consistent with normal baseline growth patterns. None of the increases in revenues would exceed the 5 percent significance standard, except where major mineral development would be foregone in the long term in WSAs designated as wilderness.

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- Areas Designated

In areas proposed for wilderness designation, existing revenues from livestock grazing would continue. Mineral revenues from leases held by production or with other prior rights would continue. An increase in commercial recreation fees is predicted. Potential annual revenues of about \$3.3 million from speculative oil and gas leases and \$4791 from potential increases in livestock forage production and fees would be foregone. New coal leasing would be precluded and this would forego Federal revenues and royalties in the long-term future.

- Areas Not Designated

With the Cluster and Interagency Areas Alternative, about 20 percent of the existing government revenues is attributed to areas not proposed for designation, these would continue. In addition, it is assumed that up to 666,641 acres within WSAs would be made available to new speculative oil and gas leasing and, with an estimated 80 percent under lease at any one time and a minimum lease rate of \$2 per acre, this could result in up to about \$1.1 million in Federal revenue. Generally, 50 percent of this increase would be transferred to the State, and a variable part of the State's share would be forwarded to local entities.

Also, in the areas not proposed, it is estimated that increases in livestock grazing of 297 AUMs with the WSAs would add about \$457 per year to Federal revenues and increases in commercial recreation would result in a small increase in Federal revenues. Parts of the grazing fees and the commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy.

Conclusion: Federal revenues would increase by up to \$1.1 million per year, primarily as a result of speculative oil and gas leasing.

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Impacts on Wilderness Values

- Naturalness

In general, naturalness would be directly impaired by disturbance from such activities as mineral exploration and development, road and other rights-of-way development, resource development, and ORV use.

Wilderness designation of all of the 83 WSAs (3,235,834 total acres) included in this alternative would protect naturalness values on 100 percent of the acreage in the 83 WSAs. Of the 3,235,834 designated acres in this alternative, 3,205,047 acres meet the Wilderness Act criteria for naturalness.

With this alternative, management of the designated wilderness areas according to the Wilderness Management Policy (BLM Manual 8560) would largely remove the potential for future surface disturbance that would reduce naturalness. Complete preservation of naturalness is anticipated in 25 of the 83 WSAs. Although protected, complete preservation of naturalness in the remaining 58 WSAs is not anticipated, largely due to the existence of valid existing rights. In the foreseeable future, naturalness values in these WSAs would be directly lost on approximately 1,017 acres due to surface disturbance. The disturbance would be due to mineral-related activities, providing access to State in-holdings, and development of range-land projects. There would be an additional perceived loss of naturalness in the area surrounding the disturbance. However, naturalness values would be preserved in the WSA as a whole in all cases. In the Rockwell, Moquith Mountain, Mt. Ellen-Blue Hills, Mt. Pennell, Devils Canyon, and Negro Bill Canyon WSAs, it would be administratively difficult to preserve naturalness in all of the designated acres because of campgrounds or established ORV use.

Conclusion: Naturalness values would be preserved overall in all WSAs. In the foreseeable future, a direct loss of naturalness values would occur on about 1,017 acres. The loss would be mostly due to valid existing rights.

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- Solitude

Wilderness designation of all of the 83 WSAs (3,235,834 acres) included in this alternative would protect the outstanding opportunities for solitude on 100 percent of the acreage in the 83 WSAs. Approximately 2,298,801 of the designated acres in this alternative have outstanding opportunities for solitude, and 937,033 do not.

In general, opportunities for solitude would be directly lost due to the same visual disturbance from mineral exploration and development, road and other rights-of-way development, resource development, and ORV use that would affect naturalness. Opportunities would also be reduced in quality by such indirect impacts as noise and dust that would occur during the period of development, and by increases in visitor use.

With this alternative, the potential for development and vehicular activity that would impair solitude would be eliminated or largely reduced. Complete preservation of solitude is anticipated in 25 of the WSAs. Although protected, complete preservation of solitude in the remaining 58 WSAs is not anticipated, due largely to the existence of valid existing rights. In the foreseeable future, solitude values in these WSAs would be directly lost on approximately 1,017 acres and indirectly reduced on an additional 129,326 acres. In the Rockwell, Moquith Mountain, Mt. Ellen-Blue Hills, Devils Canyon, and Negro Bill Canyon WSAs, it would be administratively difficult to preserve opportunities for solitude in all designated acres because of campgrounds or established ORV use.

Increases in visitor use over time would be diffused throughout the 83 WSAs, would be primitive in nature, and would generally have little affect on opportunities for solitude. In some smaller WSAs comprised of narrow canyons and in popular areas where increases would reduce solitude, wilderness management plans would identify and require the use of visitor management techniques, such as use restrictions, to preserve solitude. The following WSAs may be affected in this way: Parunuweap Canyon, Phipps-Death Hollow, Grand Gulch, Fish Creek Canyon, Mule Canyon, Cheesebox Canyon, Behind The Rocks, Mill Creek Canyon, and Negro Bill Canyon.

Conclusion: Opportunities for solitude would be preserved overall in all WSAs. In the foreseeable future,

a direct loss of solitude would occur on approximately 1,017 acres, and an indirect reduction in the quality of solitude would occur on up to an additional 129,326 acres. The loss would be mostly due to valid existing rights.

- Primitive and Unconfined Recreation

Wilderness designation of all of 83 WSAs (3,235,834 acres) included in this alternative would protect all of the outstanding opportunities for primitive and unconfined recreation values on 100 percent of the acreage in the 83 WSAs. Approximately 2,041,467 acres in 74 WSAs have outstanding opportunities for primitive and unconfined recreation, and 1,194,367 do not. Nine of the designated areas (Cedar Mountains, Howell Peak, Conger Mountain, Wahweap, Burning Hills, Death Ridge, Fremont Gorge, and Daniels Canyon) do not have any outstanding opportunities for primitive and unconfined recreation.

As with solitude, opportunities for primitive and unconfined recreation would be directly lost because of mineral exploration and development, road and other rights-of-way development, resource development, and vehicle use. Opportunities also would be indirectly reduced in quality by dust and noise that would occur in the surrounding area during the period of disturbance, and by increases in visitor use.

With this alternative, the potential for disturbance and vehicular activity that would impair opportunities for primitive and unconfined recreation would be eliminated or largely reduced. Complete preservation of the opportunities for primitive and unconfined recreation is anticipated in 25 of the WSAs. Although protected, complete preservation of opportunities for primitive and unconfined recreation in the remaining 58 WSAs is not anticipated, due largely to the existence of valid existing rights. In the foreseeable future, primitive recreation values in these WSAs would be directly lost on approximately 1,017 acres. An indirect reduction in the quality of opportunities for primitive recreation would occur on an additional 129,326 acres. However, primitive recreation opportunities would be preserved in the WSA as a whole in all cases. In the Rockwell, Moquith Mountain, Mt. Ellen-Blue Hills, Mt. Pennell, Devils Canyon, and Negro Bill Canyon WSAs, it would be difficult to preserve opportunities for primitive and unconfined recreation in all designated acres because of campgrounds or established ORV use.

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Increases in visitor use over time would be diffused throughout the 83 WSAs, would be primitive in nature, and would generally have little effect on opportunities for primitive and unconfined recreation. In popular or small areas where visitor use increases would reduce opportunities for primitive and unconfined recreation, wilderness management plans would require the use of such visitor management techniques as use restrictions to preserve primitive and unconfined recreation. The same WSAs identified for solitude would be affected this way.

Conclusion: Opportunities for solitude would be preserved overall in all WSAs. In the foreseeable future, a direct loss of solitude would occur on approximately 1,017 acres, and an indirect reduction in the quality of solitude would occur on up to an additional 129,326 acres. The loss would be mostly due to valid existing rights.

- Special Features

Wilderness designation of all 83 WSAs would contribute to the preservation of special features which are found in all of these WSAs. The potential for surface disturbance, water diversion, and vehicular activity that would harm special features would be eliminated or largely reduced. Approximately 1,017 acres of surface disturbance projected to occur in the designated areas in the foreseeable future would affect much less than 1 percent of the designated acreage, and would be designed to have little affect on special features.

With this alternative, the distribution of special features is as follows: 77 WSAs have scenic features, 49 WSAs have historical features, 83 WSAs have ecological features, 80 WSAs have geological features, and 44 WSAs have other special features which include wild horses and/or perennial waters. All 2,246 cultural sites, all inventory rivers, and all areas of high scenic quality in the 83 WSAs would be within designated wilderness. This is approximately 52 percent of the high quality scenery on BLM lands in Utah, and an estimated 18 percent of the high quality scenery in the State.

Wild and scenic inventory rivers would be protected not only by the fact that allowable surface disturbance would be minimal, but also because upstream projects that would require Federal permitting and that would affect water flow through the wilderness would probably not receive approval. This would be

the case with rivers in six of the 15 WSAs with inventory rivers (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Sids Mountain, and Mexican Mountain). All of these have potential for conflicting development upstream. The amount of water in inventory rivers flowing through the other nine WSAs (Deep Creek Mountains, LaVerkin Creek, Steep Creek, Paria-Hackberry, Deep Creek, Grand Gulch, Cheesebox, Desolation Canyon, and Westwater) would be protected, but probably would not change much even without wilderness designation. This is because headwaters or intermittent streams are involved with minimal potential for development, or because of downstream National Park water needs, or because of downstream user needs, or because of endangered fish species, any of which would allow for no significant dewatering to take place.

The increase in primitive-type visitor use over time would be diffused throughout the 83 WSAs and would have little effect on special features.

Conclusion: This alternative would preserve overall the wilderness special features found in the 83 WSAs.

Impacts on Water Uses

Approximately 719 miles of perennial streams would be in designated wilderness where nonconsumptive uses of water, such as recreation, aesthetics, and wildlife, would be found. Wilderness designation would not significantly affect existing or proposed consumptive water uses inside or outside of 41 WSAs that lack perennial streams because maintenance of existing facilities would be allowed and proposed catchments, guzzlers, spring developments, etc., could be designed and installed consistent with wilderness protection guidelines. Overall, 54 proposed livestock reservoirs would be precluded, but this would not have a significant affect on livestock grazing on a Statewide basis.

The All Wilderness Alternative would eliminate an existing St. George municipal water well temporarily allowed in the Cottonwood Canyon WSA and would prevent a municipal water development proposed by the town of Kannarraville in the Spring Creek Canyon WSA.

Designation of wilderness could complicate proposals or projects that would consumptively use water upstream of WSAs or otherwise significantly alter flow through 33 nonheadwater WSAs with perennial

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streams (see Table 39). Such projects would be hampered because changes in use or changes in points of diversion could be protested by the Federal government to maintain instream flow through the wilderness areas. The State Engineer could choose to accept or reject the protest, but the overall effect would be delay or uncertainty in project approvals. In addition, the Federal government could deny rights-of-way or other project approvals for projects that would alter water flow through designated wilderness.

Seven of the 33 potential problem areas, (Deep Creek Canyon, North Fork Virgin River, Parunuweap Canyon, Horseshoe Canyon [North], Desolation Canyon [Green River], Westwater Canyon, and Spring Creek Canyon) are on the Virgin, Green, or Colorado Rivers upstream of the Zion or Canyonlands National Parks. Wilderness would not add appreciably to existing constraints on development of these rivers which include releases required to accommodate operation of downstream dams, Federal reserved water rights for the National Parks, commitments under the Colorado River Compact for flow to the lower Colorado River Basin states, and consideration of water needs for endangered fish species.

Eighteen of the 33 nonheadwater WSAs (Deep Creek Mountains, Cougar Canyon, The Blues, Mud Spring Canyon, Paria-Hackberry, The Cockscomb, Phipps-Death Hollow, Steep Creek, Scorpion, Little Rockies, Fish Creek Canyon, Dark Canyon, Indian Creek, Mill Creek, Negro Bill Canyon, Turtle Canyon, Floy Canyon, and Daniels Canyon) have perennial streams that originate only a short distance above the WSA or are part of small drainages without the potential for major water projects upstream of the WSA. Therefore, few impacts, if any, on upstream uses would result from designation of these areas.

Nine WSAs (North Escalante Canyons/The Gulch, Dirty Devil, Fiddler Butte, Crack Canyon, Muddy Creek, Sids Mountain, Mexican Mountain, Desolation Canyon [Price River], and Fremont Gorge) have perennial streams that originate long distances above the WSAs and flow through areas where major water projects and diversions are likely in the future. The affected drainages would be the Escalante River, Muddy Creek and Dirty Devil, the San Rafael River, the Price River, and Sulfur Creek. Wilderness constraints would be placed on diversion and use of water for coal mining and coal-fired electrical power generation in the Garfield, Emery, and Carbon counties, expansion of irrigation and reservoirs in Sevier, Wayne,

Emery, and Carbon counties, and tar sand development in the Wayne and Garfield counties or on other possible new water consumptive projects.

Conclusion: Nonconsumptive uses of water for wilderness purposes would be favored in the 42 areas with perennial streams. Development of proposed municipal water sources would be precluded in two wilderness areas. Water uses upstream of the wilderness areas would not be significantly affected by wilderness designation of 74 of the 83 BLM WSAs. The All Wilderness Alternative could complicate future water diversion and use upstream of nine WSAs in Sevier, Wayne, Garfield, Emery, and Carbon Counties.

Impacts on Mineral and Energy Exploration and Production

Implementation of the All Wilderness Alternative would place maximum limitations on potential mineral and energy resource development in those WSAs where such resources may occur. Loss of mineral and energy production opportunity could occur in up to 48 WSAs which are believed to have a moderate to high certainty of occurrence of energy and mineral resources.

• Leasable Mineral Production

With this alternative, all 3,235,834 acres within the WSAs would be closed to oil and gas leasing. However, 93 existing pre-FLPMA oil and gas leases on 65,479 acres located within 11 WSAs (Death Ridge, North Escalante Canyons/The Gulch, Phipps-Death Hollow, French Spring-Happy Canyon, Fiddler Butte, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, Flume Canyon, and Winter Ridge) could be explored and developed per stipulations attached at the time of lease issuance. BLM projects that development would occur in only seven WSAs (Phipps-Death Hollow, Jack Canyon, Desolation Canyon, Coal Canyon, Spruce Canyon, Flume Canyon, and Winter Ridge). These are the WSAs containing pre-FLPMA leases with the highest potential for oil and gas exploration and development. That portion of the carbon dioxide resource under pre-FLPMA lease in the Phipps-Death Hollow WSA also could be developed.

Exploration and development of 252 existing post-FLPMA leases on 199,423 acres in 43 WSAs could also occur subject to nonimpairment provisions. However, BLM projects that these leases would expire without any exploration or development activities

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occurring. Because the remaining 2,970,932 acres (92 percent of the total acreage within the WSAs) also would be closed to leasing, no oil and gas exploration or development would occur in these areas. An undetermined amount of oil and gas could be extracted from WSAs by drilling activities adjacent to WSA boundaries. It is estimated that up to 90 percent of the estimated oil and gas resource located within the WSAs would be foregone with this alternative.

The North Escalante Canyons/The Gulch, French Spring-Happy Canyon, Fiddler Butte, and Winter Ridge WSAs contain pre-FLPMA oil and gas leases which are under application for conversion to combined hydrocarbon leases. Portions of these WSAs are located within the Circle Cliffs, Tar Sand Triangle, and P. R. Springs STSAs. Conversion of existing leases to combined hydrocarbon leases would be necessary before tar sand development could occur. However, once conversion occurred, these leases would become post-FLPMA leases and, therefore, subject to wilderness nonimpairment standards. Because it would be very difficult for tar sand development to meet nonimpairment requirements, it is projected that the leases under combined hydrocarbon lease conversion application would not be developed. No new competitive leasing for tar sand in WSAs would be allowed. Overall, about 2,693 million barrels of in-place resource would be foregone. Since this would be about 10 percent of the total estimated 25 billion barrels of in-place tar sand resource in Utah, it could be significant in the long-term future. It is noted, however, that development of the tar sand resource would be dependent on improved future technologies and resolution of environmental concerns not associated with wilderness. Therefore, wilderness designation would not, at present, be the only limitation on full extraction of the tar sand resource.

The 76,038 acres of coal leases located within the WSAs would expire and would not be reissued unless diligent development requirements are met prior to expiration. Four coal preference right lease applications that cover 22,964 acres of the Death Ridge WSA would not be approved. New coal leasing would not be allowed. Therefore, with this alternative, an estimated 5.1 billion short tons of in-place resource could be foregone. This represents approximately 17 percent of the total in-place coal resource within the State of Utah.

No development of the oil shale resource, potash, phosphate, or any other leasable minerals in the

WSAs are projected even with the No Action/No Wilderness Alternative. No development of the geothermal or hydropower resources is projected. Therefore, significant amounts of these resources would not be foregone with implementation of the All Wilderness Alternative.

Conclusion: With the All Wilderness Alternative, oil and gas resources projected to be developed in 10 WSAs would be foregone with the exception of portions of seven WSAs which contain pre-FLPMA leases. Development of the tar sand resource projected to occur in three WSAs would be foregone. Coal development projected to occur in 10 WSAs would also be foregone with the All Wilderness Alternative. No development of any other leasable energy or mineral resources is projected and, therefore, would not be foregone with this alternative.

• Locatable Mineral Production

All 3,235,834 acres of wilderness would be withdrawn from locatable mineral entry. However, development work, extraction, and patenting would be allowed to continue on 5,527 existing mining claims (110,540 acres) and any future mining claims located prior to wilderness designation. With this alternative, BLM projects that disseminated gold would be produced from the Swasey Mountain WSA. Copper and vein type silver and gold would be explored for and possibly developed from the North Stansbury Mountain, Deep Creek Mountains, Mt. Pennell, Mt. Hillers, and Little Rockies WSAs. Uranium and vanadium production is projected for Mt. Hillers, Little Rockies, Bridger Jack Mesa, Horseshoe Canyon (North), San Rafael Reef, Crack Canyon, Muddy Creek, Sids Mountain, and Mexican Mountain WSAs. In addition, exploration of uranium and vanadium is projected for up to 10 additional WSAs (see Appendix 6). Exploration and development activities would be restricted to valid mining claims existing at the time of wilderness designation. Any locatable minerals located within the WSAs but not under a valid mining claim could not be developed with this alternative, and locally significant amounts of gold, silver, copper, uranium and vanadium would be foregone. However, based on existing data, loss of locatable minerals would not be significant on a State-wide or national basis. It is not projected that significant amounts of any other locatable minerals would be foregone with this alternative.

Conclusion: All 3,235,834 acres would be closed to locatable mineral entry. Exploration and production

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

(All Wilderness Alternative)

would be allowed on 5,527 existing mining claims (110,540 acres) in 23 WSAs and any future claims located prior to wilderness designation. Any locatable mineral found within the WSAs but not under valid mining claim would be foregone. Locatable minerals foregone would not be significant on a Statewide or national basis.

Impacts on Local Economic Conditions

With this alternative, the certain existing activities would continue, but most new economic activities would not be permitted within all 83 WSAs.

• Local Employment

With the All Wilderness Alternative, the predicted baseline for population and employment would not be affected (see Chapter 3). Potential increases in future employment attributed to potential new mineral or grazing activities in WSAs would be foregone, primarily in the central, southeast, and southwest MCDs. Only a small number, of new jobs (primarily seasonal recreation guides) would be attributed to wilderness designation. While the existing and projected employment in the WSAs would be inconsequential on a Statewide basis, it would contribute to the baseline growth of the affected MCDs (see Figure 8).

No added employment would be associated with continued livestock grazing within WSAs, and the potential for livestock related new jobs would be foregone. Likewise, the potential new mineral jobs would be foregone, with wilderness management preventing new leases and the predicted possibilities of new projects for tar sand bitumen, coal, or oil and gas in the Fiddler Butte, French Spring-Happy Canyon, Winter Ridge, Carcass Canyon, Death Ridge, Burning Hills, Paria-Hackberry, Desolation Canyon, Jack Canyon, and other WSAs in the Book Cliffs region.

Increasing emphasis on tourism and related employment in Utah would continue, and would involve recreation uses within some of the WSAs, primarily those that are favorable for tourism related use, such as the Desolation Canyon, Westwater, Grand Gulch, and North Escalante Canyon/The Gulch WSAs. These WSAs would continue to be important to regional tourism activities, but would continue to account for a relatively small percentage of the Statewide tourism employment totals. Wilderness designation would increase publicity relative to the 83 WSAs, but this would not result in substantial increases in employ-

ment for two reasons: (1) studies have shown that designation publicity results in a temporary increase in wilderness visitation and that the baseline use pattern soon re-establishes (McCool, 1985), and (2) most wilderness users do not spend much in the local area adjacent to wilderness areas, but rather they purchase most equipment and supplies in their home communities prior to traveling to the more remote wilderness areas.

Conclusion: Compared to a significance standard of 5 percent change (Barber, 1986), the potential for future employment, or jobs foregone, related to the WSAs would not be significant to any of the MCDs or local communities; except for those jobs that may be foregone with elimination of the long-term potential for future extraction of large quantities of tar sand and Kaiparowits coal in Emery, Wayne, Uintah, Garfield, and Kane Counties. These foregone mineral extraction jobs would likely not be significant to any of the MCDs as a whole, but may be significant to certain nearby communities where the jobs foregone could equal or exceed 5 percent of the baseline labor force.

• Local Sales

The All Wilderness Alternative would continue the local sales patterns relative to existing activities within the WSAs.

Projected increases in activities (minerals with prior existing rights, commercial recreation, and temporary increases in visitor use) with employment as discussed above, would result in small increases in local sales, primarily in retail trade and services. A portion of the wages associated with the jobs in the WSAs would be returned to the local economy. Assuming each job at the annual average Utah wage rate of about \$12,000 per capita, this would contribute a negligible amount, widely dispersed in the local economy. A multiplier effect would further disperse a portion of these wages within the local economy. Major capital expenditures for WSA areas, would be unlikely; but should they occur they would for the most part be made outside of the WSA localities.

Conclusion: Most existing and allowed activities within WSAs would continue to have a widely dispersed effect on local sales. The only significant (greater than 5 percent) impact would occur in localities immediately adjacent to the WSAs where substantial potential employment and sales related to the long-term

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

(All Wilderness Alternative)

possibilities for major tar sand and coal projects would be foregone.

- Federal Revenues and Returns to the Local Economy

The All Wilderness Alternative would continue the existing level of Federal revenues for continued livestock grazing, with no increases in AUMs within WSAs. Revenues would continue for certain mineral activities allowed with prior existing rights. However, most existing mining claims and leases would not be continued. No new speculative oil and gas leasing would occur and potential annual lease fees of up to \$4.4 million would be foregone. Generally, 50 percent of this amount would not be available for transfer to the State, and subsequently it would not be shared with local entities. Up to \$5,248 annual lease fees from potential increases in livestock forage production also would be foregone.

It is estimated that increases in commercial recreation would result in small increases in Federal revenues. Parts of commercial recreation fees would be returned for BLM use in the local areas, and hence indirectly returned to the local economy.

Conclusion: Federal revenues of up to \$4.4 million from minerals activities (including speculative oil and gas leasing) largely would be foregone. Those from grazing in WSAs would remain essentially the same as now exists, and up to \$5,248 in annual grazing revenues also would be foregone. Revenues from commercial recreation visitation would increase slightly.

MITIGATING MEASURES

- Areas Designated

The BLM Wilderness Management Policy (BLM Manual 8560) describes how the BLM will manage certain activities and uses that are permitted within wilderness areas but are not entirely compatible with the concept of wilderness. The management policy provides direction to mitigate impacts caused by the following activities:

Access to State or private lands.

Development of valid mining claims and mineral leases, and the existing private rights that accompany such claims.

Maintenance of existing livestock, wildlife, and other facilities.

Many of these potential conflicts have been resolved through the wilderness study and environmental assessment processes, but some potential conflicts still remain. Management actions to deal with these conflicts will be addressed in specific wilderness management plans developed for each area designated wilderness.

- Areas Not Designated

Sensitive natural resources may be protected by means other than wilderness designation. Specific laws and regulations require BLM to protect threatened and endangered plant and wildlife species and cultural and visual resources. BLM is also required to manage the public lands to prevent unnecessary resource degradation. The analysis assumptions presented in the introductions to Volumes I through VI of the EIS explain the relationship between required measures and the analysis of impacts.

The BLM planning system provides a process to prescribe management practices to ensure that the resources are maintained or improved on a long-term sustained yield basis.

Mining operations on Federal mineral lands, will be managed under 43 CFR 3809 mining regulations. These regulations establish procedures to prevent unnecessary or under degradation to Federal lands from mining operations authorized by the mining laws.

UNAVOIDABLE ADVERSE IMPACTS OF THE PROPOSED ACTION

A variety of unavoidable impacts would result from wilderness designation and/or nondesignation. In the previous section, mitigating measures are identified to reduce or eliminate the identified environmental impacts. However, some impacts could not be mitigated.

- Areas Designated

In some areas designated as wilderness, energy and mineral development could occur but only on valid mining claims existing prior to designation, on unutilized oil and gas leases held by production, or on oil and gas or coal leases that were issued before

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

October 21, 1976. Otherwise, the potential for recovery of energy and mineral resources (up to amounts listed on Table 29) would be foregone. With wilderness designation, some opportunities to increase livestock use up to and additional 3,408 AUMs would be foregone. In the long term, these foregone opportunities for mineral and energy resource extraction and livestock increases would limit future opportunities for future increase in employment and income by more than 5 percent in some communities adjacent to coal and tar sand deposits but less than 1 percent on a Statewide basis.

Closures to vehicle use in designated areas would result in declines in vehicle-oriented recreation that, in some cases, would not be offset by increases in primitive recreation. Although much of the vehicle-oriented recreation would shift to other nonwilderness areas, some use shifts would inconvenience users.

• Areas Not Designated

In the areas not designated wilderness, several activities could occur that would reduce the quality of wilderness values, adversely affecting naturalness, opportunities for solitude and primitive recreation, and special features. Proposed activities, including energy and mineral development and implementation of livestock and wildlife projects, would directly affect the acres on which they occurred and could indirectly affect much larger areas from where they could be seen or heard.

Nondesignated lands would be available for development of new access roads associated with mineral and energy resources and State land in-holdings, for increases in grazing and ORV use, and for possible construction in potential utility corridors. Despite mitigating measures, such activities would further reduce wilderness qualities.

Over the long term, it is projected that 41,248 WSA acres (1.3 percent of the WSA lands under study in this environmental impact statement) would be directly disturbed and wilderness values would be permanently or temporarily impacted. Surrounding areas estimated at 300,000 to 400,000 acres could be indirectly impacted.

In some of the WSAs, the following special features also could be damaged or lost due to the direct and indirect impacts of development: crucial wildlife habitats, threatened or endangered species, scenic values, and cultural resources.

Off-road vehicle use would continue along jeep trails, vehicle ways, and some washes in WSAs not designated wilderness. Impacts to solitude caused by ORV noise and the sight of vehicles would occur. The quality of primitive recreation opportunities would decline in some areas because of the sights and sounds of vehicle-based recreationists.

New rights-of-way could be issued in WSA lands not designated wilderness. Wilderness values could be unavoidably impacted because new roads, railroads, pipelines, or other structures could be built in the future on or across some WSA lands.

Installation of range and wildlife projects would unavoidably impact the wilderness value of naturalness.

CUMULATIVE IMPACTS

The Statewide EIS process represents both a site-specific and a cumulative impact analysis. Chapter 3 of Volume I provides cumulative information for all resources considered. Chapter 4 provides cumulative analysis for resources related to significant Statewide issues.

RELATIONSHIP BETWEEN SHORT-TERM USES AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The 83 WSAs are managed under the Interim Management Policy (IMP) until Congress either releases the areas to other multiple uses or designates them wilderness. During this period, all WSAs are managed according to the IMP to preserve wilderness values, subject to valid existing rights.

• Areas Designated

Wilderness designation would enhance long-term ecological and scenic values, and generally it would maintain naturalness, solitude, opportunities for primitive recreation, and special features.

Within designated areas, the consumptive or disruptive uses of resources (including vehicle-oriented recreation) would be foregone in the short term and long term, unless future conditions resulted in release from wilderness designation in the long term.

With the BLM Proposed Action Alternative, wilderness designation would preserve wilderness values in both the short term and the long term in all or parts of 66 WSAs.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

• Areas Not Designated

Consumptive uses of resources on lands not designated wilderness (particularly mineral and energy development, rangeland vegetation manipulation projects to generate forage increases, and ORV use) would lead to long-term degradation of the wilderness values on those lands.

Such activities are predicted to occur periodically and randomly over the long term. With the No Action/No Wilderness Alternative, this would occur on 58,968 acres within 64 WSAs, and with the BLM Proposed Action Alternative, it would occur on 564 acres in designated areas where prior rights exist and on 40,684 acres in nondesignated areas.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Although wilderness designation would constitute a long-term commitment of resources, such designation would be reversible by Congress. With the BLM Proposed Action Alternative, wilderness designation of portions of 36 and all of 30 WSAs would not create an irreversible or irretrievable commitment of resources. Designation as wilderness would restrict or prohibit the development of some natural resources in order to maintain the wilderness values. If, in the future, Congress determines that commodity resources present in a wilderness area must be used in the national interest, it can modify the law to allow for the development in any particular area.

Nondesignation as wilderness would leave WSAs available for development, which could irreversibly degrade their wilderness values, foreclosing the option of wilderness designation in the future.

To varying degrees, the BLM Proposed Action Alternative may involve irreversible and irretrievable commitments of certain resources in parts of the 53 WSAs either wholly (17) or partially (36) not recommended for wilderness designation. The use of lands in the nondesignated WSA areas for such activities as mining, motorized vehicles, and rights-of-way may result in irreversible and irretrievable losses of wilderness values over the long term.

The following irreversible and irretrievable resource commitments directly impacting wilderness values or special features (wildlife, wildlife habitat, scenery, cultural resources) on a total of 41,248 acres scat-

tered in various locations within 57 of the 83 WSAs are anticipated with the Proposed Action Alternative:

1. Minerals: Impacts on up to 25,107 acres for leasable and locatable mineral activities.
2. Livestock: Impacts on 8,834 acres from vegetation treatments and facilities.
3. Wildlife: Impacts on 5,872 acres from habitat projects.
4. Watershed: Impacts on 454 acres for a reservoir and erosion control projects.
5. Access: Impacts on 326 acres from roads and vehicular access to inheld lands.

Chapter 5

Coordination and Consultation



CHAPTER 5: COORDINATION AND CONSULTATION

INTRODUCTION

Scoping for the Utah BLM Statewide Wilderness EIS began in 1982. A summary of the scoping process and issues up to the publication of the Draft EIS is presented in Chapter 5 and Appendix 2 in Volume I of the Draft EIS. This Chapter summarizes scoping efforts after publication of the Draft EIS.

THE PUBLIC COMMENT PERIOD

The official comment period for the Draft EIS began on January 31, 1986. The original deadline for receipt of written comments was June 15, 1986. The deadline was extended to August 15, 1986, in response to public requests for additional time for review.

Notification of the original comment period and the extended comment deadline were published in the Federal Register on February 3, 1986, and April 2, 1986, respectively. The first Federal Register notice contained a public hearing schedule. This schedule was

also included in all copies of the Draft EIS. News releases announcing the availability of the Draft EIS, the original and extended comment periods, and public hearing schedule were issued throughout Utah and neighboring states. The second Federal Register notice included an errata listing.

Copies of the EIS were furnished to numerous public libraries in Utah for public review and reference. Also, copies were widely distributed to those expressing interest. In addition to individuals and others receiving a copy of the Draft EIS as a result of the mailing list or separate requests, many agencies and organizations were requested to review the document.

The list of agencies and organizations requested to review the Draft EIS is included on Table 84. Other agencies that received and commented on the Draft EIS, but were inadvertently excluded from this list include the Uintah-Ouray Indian Tribe, Navajo Indian Tribe, White Mountain Indian Tribe, Rocky Mountain Federation of Minerals, and World of Rockhounds.

Table 84
Agencies, Officials, and Organizations Receiving the Draft EIS

FEDERAL GOVERNMENT AGENCIES

Department of Agriculture

- Agricultural Stabilization and Conservation Service
- Farmers Home Administration
- Forest Service (various offices)
- Soil Conservation Service (various offices)

Department of Defense

- U.S. Air Force
- Nellis Air Force Base
- Hill Field Air Force Base
- U.S. Army Corps of Engineers

Department of Energy

- Bonneville Power Administration
- Federal Energy Regulatory Commission
- Western Area Power Administration
- Environmental Protection Agency (various offices)

Department of the Interior

- Bureau of Mines (various offices)
- Bureau of Indian Affairs (various offices)
- Bureau of Land Management (various offices)
- Bureau of Reclamation (various offices)
- Fish and Wildlife Service
- Geological Survey (various offices)
- National Park Service (various offices)
- Minerals Management Service
- Office of Surface Mining

Department of Transportation

- Federal Highway Administration
- Federal Aviation Administration

CONGRESSIONAL OFFICIALS

- Senator Orrin G. Hatch
- Senator Jake Garn
- Representative David S. Monson
- Representative Howard C. Nielson
- Representative James V. Hansen

CHAPTER 5: COORDINATION AND CONSULTATION

Table 84 (Continued)
Agencies, Officials, and Organizations Receiving the Draft EIS

STATE GOVERNMENT AGENCIES

Office of the Governor
Utah
Nevada
Utah Department of Agriculture
Extension Service
Utah Department of Community and Economic Development
Library Division
Travel Council
Division of History (SHPO)
Utah State Department of Health
Bureau of Air Quality
Utah Department of Natural Resources and Energy
Utah State Wilderness (Ad Hoc) Committee
Utah Geological and Mineral Survey
Utah Division of Parks and Recreation
Utah Division of Oil, Gas, and Mining
Utah Division of State Lands and Forestry
Utah Division of Water Resources
Utah Division of Water Rights
Utah Division of Wildlife Resources
Utah Office of Planning and Budget
Nevada Office of Planning Coordination
Utah Public Service Commission
Utah Department of Transportation

TRIBAL GOVERNMENTS

Paiute Indian Tribe of Utah
P Kaibab-Paiute Indian Tribe of Arizona
Ute Tribal Resource Department
Ute Indian Tribe
Goshute Indian Tribe

COUNTY GOVERNMENTS

Beaver County Commission
Carbon County Commission
Emery County Commission
Garfield County Commission
Grand County Commission
Iron County Commission
Juab County Commission
Kane County Commission
Lincoln County Commission (Nevada)
Millard County Commission
San Juan County Commission
Tooele County Commission
Uintah County Commission
Washington County Commissioners
Wayne County Commission

ORGANIZATIONS

American Fisheries Society
American Mining Congress
American Petroleum Institute
American Right-of-Way Association

American Recreation Coalition
American Wilderness Alliance
Bridgerland Audubon Society
Carbon-Emery Wildlife Federation
Carbon-Emery Motorcycle Association
Colorado Open Space Council
Council on Utah Resources
COSC Wilderness Workshop
Defenders of the Outdoor Heritage
Desert Protective Council
Earth First!
East Carbon Wildlife Federation
Ecology Center (USU)
Environmental Defense Fund (Washington D.C.)
Environmental Studies Committee (USU)
Farm Bureau Federation
Five County Association of Governments
Four Corners Wilderness Workshop
Friends of Canyon Country
Friends of the Earth (Moab)
Friends of the Earth (San Francisco)
Friendship Cruise
Humane Society of Utah
Intermountain ORV Racing Association
Kolob-River Audubon Society
League of Women Voters (Salt Lake City)
Minerals Exploration Coalition
Monticello Rod & Gun Club
Mountain States Legal Foundation
National Audubon Society
National Cattlemen's Association
National Mustang Association
National Organization for River Sports
National Parks Conservation Association
National Resource Development Council
National Wildlife Federation (Washington, D.C.)
National Wildlife Federation (St. Louis)
National Wool Growers Association
Nature Conservancy
Natural Resources Defense Council (San Francisco)
Nevada Cattlemen's Association
Nevada Outdoor Recreation Association
Outdoors Unlimited, Inc.
Paria Resource Council
Petroleum Information
Professional River Outfitters Association
Red Rock Four Wheelers
Rio River Runners
Rocky Mountain Oil & Gas Association
Save Our Canyons Committee
Sierra Club (several Chapters and Groups)
Sierra Club Legal Defense Fund
Six-County Commissioners Organization
Slickrock County Council
Slickrock Outdoor Society
Society for Range Management
Southeastern Utah Association of Local Governments
Southern Utah Wilderness Alliance
South Side Association

CHAPTER 5: COORDINATION AND CONSULTATION

Table 84 (continued)
Agencies, Officials, and Organizations Receiving the Draft EIS

Southwest Resource Council
The Wilderness Society (Denver)
The Wilderness Society (Washington, D.C.)
Tooele Wildlife Federation
Trout Unlimited
Uintah Basin Energy Council
United Four Wheel Drive Association
Upper Colorado Environmental Plant Center
Utah Association of 4WD Clubs
Utah Association of Counties
Utah Association of Soil Conservation Districts
Utah Audubon Society
Utah Cattlemen's Association
Utah Coal Operator's Association
Utah Farm Bureau Federation
Utah Farmers Union
Utah Gem & Mineral Society
Utah Geological Association
Utah Heritage Foundation
Utah Horse Council
Utah Humane Society
Utah Manufacturers Association
Utah Mining Association
Utah Native Plant Society

Utah Nature Study Society
Utah Petroleum Association
Utah Recreation Land Users
Utah Rural Electric Association
Utah Water Pollution Control Association
Utah Water Resource Council
Utah Water Users Association
Utah Wildlife & Outdoor Recreation
Utah Wildlife Federation
Utah Wool Grower's Association
Utah Wilderness Association
Utah Wilderness Coalition
Uintah Basin Association of Governments
Wasatch Mountain Club
Western Land Users Association
Western River Guides Association
WHOA
Wilderness Alliance
Women's Council of Utah
Women's Legislative Council of Utah
Wildlife Society, Inc.
Wildlife Society (Utah Chapter)
Wyoming Outdoor Council

Copies of the Draft EIS and a schedule of the public hearings were sent to Utah State Governor Norman Bangerter; U.S. Senators Orrin G. Hatch and Jake Garn; U.S. Representatives Wayne Owens, Howard C. Nielson, and James V. Hansen; four members of the Utah State Legislature; 30 Federal agencies; 17 Utah State agencies; and numerous organizations and individuals.

Seventeen public hearings were held at sixteen locations throughout Utah in May 1986. Table 85 lists the locations and dates of each hearing and the number of people presenting oral testimony at each. Transcripts of the public hearings and copies of letters submitted during the comment period were available for review at the Utah State Office Public Room, 324 South State, 4th Floor, Salt Lake City, Utah. Oral testimonies, and letters received from Federal, State and local officials, agencies, and departments are reprinted and responded to in Volume VII-A, of this Final EIS.

PUBLIC COMMENTS

Approximately 4,496 inputs with 6,213 signatures were received during the public comment period. Because of the large number of comments submitted, all oral testimonies and comment letters are not printed in the Final EIS. As noted above, Volume VII-A, contains reprinted transcripts of oral testimonies

and letters received from Federal, State and local officials, agencies, and departments. Selected representative testimony and letters from special interest groups, industry and individuals also are included in Volume VII-A. Volumes VII-B and VII-C contain representative comments and responses about the State-wide issues, alternatives, public concerns, and specific WSAs.

Table 85
Public Hearings on the Draft EIS

Location	Date	Number of Commentors
Vernal, Utah	May 7, 1986	52
Provo, Utah	May 7, 1986	35
Escalante, Utah	May 7, 1986	28
Monticello, Utah	May 7, 1986	36
Tooele, Utah	May 8, 1986	26
Kanab, Utah	May 8, 1986	67
Moab, Utah	May 8, 1986	58
Ogden, Utah	May 13, 1986	24
Cedar City, Utah	May 13, 1986	39
Loa, Utah	May 13, 1986	26
Price, Utah	May 13, 1986	30
Logan, Utah	May 14, 1986	28
St. George, Utah	May 14, 1986	41
Delta, Utah	May 14, 1986	19
Castle Dale, Utah	May 14, 1986	62
Salt Lake City, Utah	May 15-16, 1986	<u>138</u>
Total		709

CHAPTER 5: COORDINATION AND CONSULTATION

A summary of public comments will be included in Wilderness Study Reports that will accompany this Final EIS as it is submitted to the President and Congress. This summary will inform decisionmakers and others regarding public views concerning wilderness designation and nondesignation.

ISSUE IDENTIFICATION

BLM used the information obtained from scoping, including comments on the Draft EIS, along with input from BLM personnel to identify the issues and alternatives analyzed in this Final EIS. Significant and insignificant issues are identified in Chapter 1 in Volume I and the introductions to individual WSA analyses in Volumes II through VI.

Approximately 4,455 inputs were received during the public comment period. Because of the large number of comments received, all oral testimony and comment letters were not included in the Final EIS. As noted above, Volume VII contains a summary of the public comment period. The public comment period was held at various locations and dates of each hearing and the number of people presenting oral testimony at each hearing. The public hearing and copies of letters received during the comment period were available for review at the Utah State Office Building, 350 South State, 4th Floor, Salt Lake City, Utah 84111. Letters, and letters received from Federal, State and local officials, agencies, and organizations are included and responded to in Volume VII-A of the Final EIS.

Letters received from the public and a schedule of the public hearings were sent to Utah State Representative James H. Hansen, U.S. Representative Orrin G. Hatch and the Senator, U.S. Representative Wayne Owens, Royce L. Wilson, and James M. Hansen, the Governor of the Utah State Legislature. Letters received from the State agencies and non-State organizations and individuals are included in Volume VII-B of the Final EIS.

Seventeen public hearings were held at various locations throughout Utah in May 1982. The 28 public hearings and dates of each hearing and the number of people presenting oral testimony at each hearing are included in the public hearing and copies of letters received during the comment period were available for review at the Utah State Office Building, 350 South State, 4th Floor, Salt Lake City, Utah 84111. Letters, and letters received from Federal, State and local officials, agencies, and organizations are included and responded to in Volume VII-A of the Final EIS.

Approximately 4,455 inputs were received during the public comment period. Because of the large number of comments received, all oral testimony and comment letters were not included in the Final EIS. As noted above, Volume VII contains a summary of the public comment period. The public comment period was held at various locations and dates of each hearing and the number of people presenting oral testimony at each hearing. The public hearing and copies of letters received during the comment period were available for review at the Utah State Office Building, 350 South State, 4th Floor, Salt Lake City, Utah 84111. Letters, and letters received from Federal, State and local officials, agencies, and organizations are included and responded to in Volume VII-A of the Final EIS.

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The Draft EIS identified people who participated in the original studies and the preparation of the Draft EIS. The BLM proposed action for the Final EIS was developed by the District Managers and the State Director in 1988 and endorsed by the current management team:

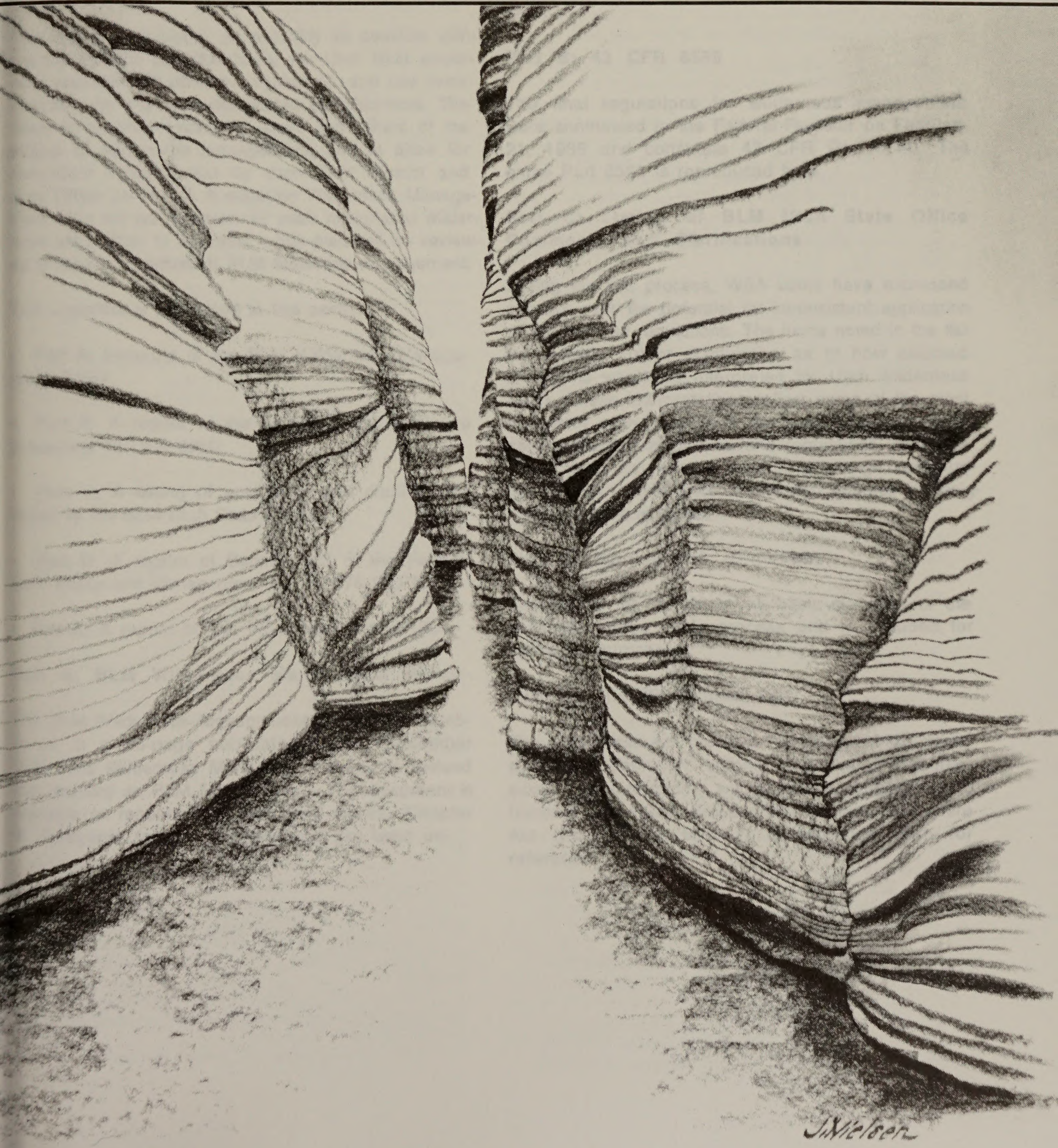
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The people who assisted in the public comment analysis and response, and/or contributed to preparation of the Final EIS are as follows:

Name	Formal Qualification	Years of Experience	Major Assignment
Aldred, Claudia A.		12	Typing
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Biggins, James G.	Phd Geography	17	Land Use Plans, Data Compilation
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Boyer, Kenneth	BS Range Management	27	Livestock Data Update
Christensen, Boyd	BS Forestry and Watershed	21	Water Data
D'Auray, Teresa D.		5	Typing, Proofreading
Farringer, Jerald	MS Aquatic Ecology	16	WSA Analysis Revisions
Floor, Robin		6	Cartography
Harmon, Craig B.	MA Anthropology	18	WSA Analysis Revisions
Hindley, Earl C.	BS Forestry and Range Management	26	WSA Analysis Revisions
Holzer, Norine		16	Typing, Proofreading, Editing
Horsburgh, Charles	BS Geology	15	Energy and Minerals Projections
Howard, Steve	BS Forestry and Range Management	23	WSA Analysis Revisions
Ivie, LaRae N.		15	Typing
James, Mark	MS Public Administration	1	Data Compilation
Jensen, Jens	BS Range Management	34	WSA Analysis Revisions
Kelsey, Margaret	BS Natural Resources	14	Wilderness Values, Analysis Revisions
Knowles, Kenneth	BS Range Management	17	WSA Analysis Revisions
Korzendorfer, Barbara	BS Geology	7	Energy and Minerals Update from BLM Review Team
Langenegger, Sharon		13	Typing
Larsen, R. Elaine	AD Business	13	Public Comment Tracking and Analysis
Lindgren, Robin		6	Cartography
Lopez, Robert	AA Business Management	18	Mineral Lease Update
Maxfield, Larry	BS Range Management	23	Livestock Data Update
Moe, Jeanne	MA Anthropology	15	WSA Analysis Revisions, Data Compilation
Nielson, Max	MS Agriculture, Economics	25	Minerals Data
Nielsen, John H.	Art Courses	28	Illustrations
Page, Richard	MS Range Management	30	Salinity Data
Peterson, Jack	MS Forest Management	15	Recreation
Slater, Thomas F.	MS Landscape Architecture	28	Chief, Branch Planning, Environmental Coordination, and Recreation
Soriano, Maria M.	BS Geological Engineering	1	Mining Claim Update
Thayn, Gregory F.	Phd Botany	15	EIS Team Leader

In addition, numerous people in the Utah BLM District and Resource Area Offices reviewed Volumes II through VI.

Appendices



APPENDIX 1

WILDERNESS PROTECTION STANDARDS

INTRODUCTION

This appendix presents, as explicitly as possible without site-specific considerations, the Utah BLM wilderness management policies, regulations, and use determinations for any area designated as wilderness. The intent is to advise potential users and others of the effects of wilderness management, and to allow for consistent interpretation by Utah BLM District and Area Office personnel. A separate Wilderness Management Plan will be prepared for each designated wilderness area. Prior to approval, each plan will be reviewed to maintain consistent BLM Statewide management.

This appendix is presented in five parts:

- Part A: Excerpts of the BLM Wilderness Management Policy;
- Part B: A reprint of the Federal Register Notice presenting 43 CFR 8560;
- Part C: A listing of comments and clarifications added by the BLM Utah State Office;
- Part D: A reprint of Section 603 of the Federal Land Policy and Management Act of 1976 (FLPMA);
- Part E: A reprint of The Wilderness Act of 1964.

Part A: BLM Wilderness Management Policy

The BLM Wilderness Management Policy was established in a 36-page publication dated September 1981. The Wilderness Management Policy is revised and updated as BLM Manual 8560. This document is available on request from most BLM offices. "Chapter III, Guidelines for Specific Activities" has been ex-

tracted from the 1981 publication and is presented here.

Part B: 43 CFR 8560

The final regulations for wilderness management were announced in the Federal Register on February 21, 1985 and constitute 43 CFR Part 8560. The entire Part 8560 is reproduced here.

Part C: Listing of BLM Utah State Office Comments and Clarifications

During the EIS process, WSA users have expressed concern over the potential for inconsistent application of policies and regulations. The items noted in the listing provide further clarification as to how selected provisions would be interpreted for Utah wilderness areas. These interpretations reflect some of the most commonly asked questions about application of wilderness management policies and regulations. Also, the list contains key criteria influencing design, construction, and/or maintenance of selected features in designated wilderness areas.

Part D: Section 603 of FLPMA

This section of FLPMA is the basic mandate for the BLM wilderness study process and is included for reference purposes.

Part E: The Wilderness Act

The Wilderness Act provides the philosophical basis, wilderness definition, criteria, and overall Congressional policy regarding wilderness. It establishes the National Wilderness Preservation System. The entire Act (Public Law 88-577) is reprinted here for reference.

Chapter III. Guidelines for Specific Activities

The guidelines in this chapter are an application of the policies set forth in Chapter II to various activities that may or may not take place in BLM-administered wilderness areas. These guidelines are also based on other applicable laws and on other policies and regulations of the Department of the Interior.

These guidelines will be used in developing a Wilderness Management Plan for each BLM-administered wilderness area, containing guidance on how specific activities will be treated in that area. Until such time as a Wilderness Management Plan is approved by the State Director, interim decisions on specific activities in a wilderness area will be made by BLM field officials based on these guidelines.

Decisions on any activities not addressed in these guidelines will be made on the basis of the policies in Chapter II.

III. A. Recreation and Visitor Use

Wilderness areas administered by the BLM shall provide a variety of uses including, but not limited to, recreational, scenic, scientific, educational, conservation, and historical.

The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use. There are places and times within wilderness where unique values may require that recreation and visitor use activities be restricted or entirely prohibited in order to preserve an enduring resource of wilderness. The highest priority among various kinds of visitor use will be accorded those activities which (1) are most dependent upon the wilderness environment and cannot be reasonably accommodated outside of wilderness, (2) least affect the wilderness environment.

Consideration must be given to the ability of the wilderness resource to sustain visitor use without loss or degradation of the wilderness resource itself. Carrying capacity—social, biological, and physical—may vary widely within and between wilderness areas due to variations in types and amounts of uses, resource characteristics, and the capabilities of the resources to sustain different types and amounts of uses. The leading management tool and document to consider these factors and set guidelines for managing visitor use will be the Wilderness Management Plan. These plans will describe the level at which an area is able to absorb use and impacts and will describe measures needed to protect wilderness values.

The following specific guidance applies to visitor use within BLM wilderness:

1. Visitor Management

Visitor management techniques will be utilized in wilderness when necessary to preserve both the wilderness resource and the visitor's wilderness

experience and opportunities. Management of visitor use will be the minimum necessary to provide for use of the area as wilderness, and to preserve the wilderness character of the area.

Visitor management should be planned to maintain a high-quality wilderness resource and to protect the quality of the wilderness experience. The Wilderness Management Plan will consider all appropriate and compatible methods to manage levels of use that are within the capacity of the wilderness. Visitor management may be carried out by both direct and indirect methods.

a. **Indirect Methods.** Visitor use may be managed through such indirect efforts as:

(1) Wilderness rangers informing visitors about less congested areas.

(2) Obliteration of improvements at overcrowded or undesirable sites.

(3) Improved access to tributary, lightly used areas.

(4) Information to (a) encourage use of lightly used or relatively unknown areas, or to (b) stress the experiences and value to be found outside the peak use period.

(5) Minimize the promotion of an outdoor experience in wilderness and emphasize such uses of undeveloped areas outside wilderness.

(6) Reroute primary transportation away from major destination areas. Have spur trails to vistas or camp areas.

(7) Design and management of trail-head areas, including access roads and parking areas.

(8) Education of visitors about good wilderness manners and ethics.

(9) Use of built-in frictions or obstacles, such as low-standard access roads.

(10) Removal of trail-head improvements and/or restriction of travel into areas already overused or where capacity use already occurs.

b. **Direct Methods.** More direct methods to achieve visitor management may include:

(1) Regulating the use of saddle horses and/or pack stock.

(2) Managing areas strictly for foot or horse use only, to protect sensitive sites and resources, or to provide different recreation opportunities or experiences within the wilderness.

(3) Requiring permits for specific areas or time periods. A permit or registration system can be an important tool for both the wilderness manager and wilderness visitor. Both systems provide visitor use data on the number and distribution of visitors. In addition, a permit or registration system can give the visitor site-specific information helpful in preplanning a trip. A permit system can be utilized also to limit or redistribute and disperse visitor use.

(4) Limiting the number of people in parties or the number permitted to stay overnight at specific locations.

(5) Limiting numbers of users. The Wilderness Management Plan will analyze needed methods and identify necessary measures.

(6) Stock grazing or canoe/boat-beaching

APPENDIX 1, PART A

restrictions, both private and commercial, on over-used or concentration areas.

2. Improvements and Facilities

Facilities and improvements such as trails, bridges, signs, and campsites, will be provided only where they are the minimum necessary for protection of the wilderness resource and for the health and safety of persons within the area. No facilities or improvements will be provided for the comfort and convenience of the visitor. The need for proposed facilities, such as latrines, fire circles, and fences will be justified in the Wilderness Management Plan. Improvements and facilities when approved will be constructed of materials which harmonize with the natural environment.

Existing improvements or facilities not specifically provided for in these guidelines—those having no historical value and not necessary for preservation of an area's wilderness character or for the health and safety of persons within the area—will be removed.

Construction, maintenance, and removal of facilities and improvements will be by primitive means. Exceptions to this policy, such as using handpowered portable tools and aircraft, may be approved by the State Director if no other alternatives exist, the mechanized or mechanical equipment is the minimum necessary, and they will not degrade or impair the area's wilderness character.

a. Trail Systems

(1) New trails will be constructed only if they are needed to preserve wilderness values and resources and they will not significantly degrade the degree of naturalness or solitude in the area. Trails are an acceptable improvement provided they are constructed and maintained so they have an insignificant impact on wilderness values. Wilderness management plans will address where trails and related facilities are appropriate.

(2) Existing trails and trail systems will be evaluated to determine if they are the minimum necessary to meet wilderness management objectives. Trails may be expanded, relocated, restored, or closed as a result of the evaluation. Wilderness Management Plans will address the present situation and evaluate future needs. Trailhead access points will be evaluated at this time. Trailhead locations should be carefully chosen as they have a profound influence over management of visitor use. It may be desirable to locate trailhead access points well outside the wilderness boundary to reduce their impact upon the wilderness area.

(3) Trail routes shall be selected to provide scenic vistas and, where possible, a varied scene. Heavily used areas should generally be served by spur trails and should be bypassed by primary trails. Trails will not be constructed with treads of more than 24 inches in width except where a wider trail is justified for protection of the wilderness resource. Trails should follow natural contours where possible and result in minimum disturbance to soil and ground cover.

(4) Bridges will be designed and constructed so as to harmonize with the environment and will be the minimum size and complexity necessary to allow foot or stock use. Besides adhering to the basic standards set out for improvements and facilities above, bridges will be provided only:

(a) When no other route or crossing is reasonably available.

(b) Where the crossing, during the primary season of public use:

—Cannot be safely negotiated on foot.

—Cannot be safely forded by horses.

(c) Where less formal devices are frequently destroyed or damaged by flood water.

b. Signing

Only a minimum of signs will be provided for the visitor, in combination with availability of accurate maps, route descriptions, brochures, etc. Signs will be provided primarily for visitor safety and resource protection. Signs will not be placed within the wilderness for the convenience of the user.

(1) Signs may be erected at trail junctions, showing directions with arrows.

(2) Informational or interpretive signs will not be used to mark streams, lakes, mountain peaks, passes, or points of interest.

(3) Regulatory signs will be kept to the minimum necessary, and may be of materials other than wood. When regulatory signs are posted within a wilderness, notice pertaining to these regulations will also be posted at trailheads or major access points and published where feasible on brochures or maps or otherwise made available to the user prior to entry into the wilderness.

c. Use of Campsites

(1) Campsites or camping areas may be designated if necessary for the purpose of wilderness resource protection. They will be located sufficiently distant from lakes, streams, trails, or other natural attractions as to allow appropriate use without unacceptable degradation of the focal point of public interest. Space between sites should be sufficient to ensure a reasonable degree of solitude and quiet. A "no-trace" camping concept will be promoted.

(2) Shelters or lean-tos will not be constructed, and existing shelters will be removed from within wilderness. Shelters or lean-tos determined to have historical value may remain, and their protection and use will be addressed in the Wilderness Management Plan.

(3) Garbage pits will not be permitted, and existing garbage pits will be closed. A "pack-it-in, pack-it-out" philosophy will be encouraged with visitors. Every practicable medium will be used to educate and inform the visitor on this point.

(4) Improvised camp structures constructed by visitors will not be permitted. They will be dismantled and obliterated when and where found.

(5) Hitchracks or corrals and other improvements to facilitate stock use may be used as necessary to prevent damage to the wilderness resource. They will be located away from main-traveled trails, streams, lakes, camping areas, and focal points of in-

terest, and will be constructed of materials which harmonize with the environment.

d. Outfitter Camps

The Wilderness Management Plan will carefully analyze the role of the outfitter-guide in a particular wilderness. Some wilderness areas may not be particularly suited to this kind of service due to size, shape, location, etc., or to the objectives for management of a particular wilderness. Also, the visitor-use capacity of the wilderness as well as public needs must be considered in making a decision to permit or not permit outfitter-guide services. If allowed, these services will be planned and administered to meet public needs while maintaining the wilderness resource. Operations will be so administered as to be harmonious with those of wilderness visitors who do not employ such services.

Outfitter-guide camps will be located off the primary trails or scenic spur trails and at sufficient distance from attractions to avoid conflicts with other visitors. The BLM will select the location of outfitter-guide campsites as necessary to protect wilderness resources and the wilderness experience of other visitors. Outfitter-guides will operate under special recreation permits, which will include stipulations for management of the use. The Wilderness Management Plan shall evaluate the need for temporary caches not involving erection of structures and shall designate their locations, if caches are to be approved.

3. Fuelwood

If campsites or cooking fires are permitted, fuelwood cutting should be limited to dead and down material. The use of portable cookstoves will be encouraged whenever possible. The Wilderness Management Plan will define any regulations or restrictions needed for wilderness resource protection.

4. Contests

Contests, such as physical or mental endurance of a person or animal; foot races; canoe or boat races; competitive trail rides; survival contests or exercises (including military); and other activities of this nature shall not be permitted in wilderness areas. These activities do not depend on a wilderness setting, and they cause impacts that degrade the wilderness character of the area, thus adversely affecting wilderness-dependent uses.

5. Recreational or Hobby Mineral Collecting

Recreational or hobby collecting of mineral specimens (rockhounding) will be allowed in wilderness. Such use will be limited to hand methods or detection equipment that does not cause surface disturbance, such as a metal detector or Geiger counter. In addition, methods shall not be permitted that in any way adversely affect or degrade the wilderness resource or the experiences of visitors in the area. (This paragraph does not cover mining claims, which are addressed in section III. I below.)

III. B. Cultural and Historic Resources

Archeological and historical sites and values are a unique and nonrenewable part of the wilderness

resource. They are protected by provisions of the Uniform Rules and Regulations (43 CFR Part 3) to carry out the Antiquities Act of 1906, the Historic Sites Act of 1935, Executive Order 11593, the National Historic Preservation Act of 1966, as amended, and the Archeological Resources Protection Act of 1979. To the extent not inconsistent with the concept of wilderness preservation and the intent of the Wilderness Act, and objectives for cultural resource management, these resources are available for recreational, scenic, scientific, educational, conservation, and historical uses (including ceremonial or religious use by Native Americans).

Cultural resources, in most instances, will be subject to the forces of nature in the same manner as other wilderness resources. Study or management will not normally include any excavation, stabilization, or interpretation activities. Salvage, rehabilitation, stabilization, reconstruction, and restoration work on archeological and historic sites; excavation; and intensive inventories may be permitted on a case-by-case basis where the project will not degrade the overall wilderness character of the area and such activity is needed to preserve the particular resource. State Director approval is required for all such projects.

The National Historic Preservation Act and Executive Order 11593 require an inventory and evaluation of cultural resources. The evaluation study for National Register of Historic Places eligibility is made using criteria in 36 CFR 1202.6 and in consultation with the State Historic Preservation Officer (SHPO). Those cultural resources found to qualify are nominated to the National Register of Historic Places.

Those sites or structures that do not qualify for the National Register may be allowed to deteriorate naturally, or be removed or obliterated. However, some structures may qualify for retention as historic features or under the "minimum tool" policy (refer to section II. B. 3), or as facilities necessary for a use specifically permitted by the Wilderness Act or by the law designating the affected wilderness area.

Management direction for cultural resources that qualify for nomination to the National Register is subject to compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800. A decision to remove, maintain, or allow historic or prehistoric structures to deteriorate naturally is a Federal undertaking which will affect the resources. In working through the compliance processes, a determination will be made as to what feasible and prudent alternatives exist to satisfactorily mitigate adverse effects of the proposed decision on the cultural resources. A Memorandum of Understanding will be developed with all consulting parties whenever an adverse effect determination is made (36 CFR 800). The range of alternatives might include recording to established standards (by drawings and photographs), salvage (by removing or dismantling), stabilizing, or restoration. Stabilization or restoration and subsequent maintenance may be considered for administrative structures that meet the "minimum tool" policy (refer to section II. B. 3).

III. C. Forestry Resources

1. Cutting of Trees and Shrubs

Management of the forest cover will be directed toward retaining the primeval character of the environment and allowing natural ecological processes to operate freely. Trees, shrubs, and other vegetative products will not be sold or cut for nonwilderness purposes except under specified conditions set forth in these guidelines for valid mining claims and under emergency conditions such as fire, insect, and disease control.

2. Cutting of Trees for Administrative Purposes

Trees may be cut for use in the construction and maintenance of authorized improvements that are located within the wilderness when the necessary material cannot be reasonably obtained or brought in from outside the wilderness. Such cutting within the wilderness shall be done away from trails or campsites, and all evidence of the cutting shall be disposed of insofar as possible.

3. Cutting of Trees for Fuelwood

(Refer to section III. A. 3., Fuelwood, for specific guidance.)

4. Reforestation

Reforestation, in the absence of natural revegetation, will generally be prohibited, but in rare cases may be authorized by the Director to prevent deterioration or loss of the wilderness resource when the cause of the damage or loss is due to human activities and there is no reasonable expectation of natural reforestation. The natural processes of ecological succession will be the preferred method of site-restoration. When reforestation action is necessary, only native species and only primitive methods, such as hand planting, will be used.

III. D. Fish and Wildlife

Management will seek a natural distribution, number, and interaction of indigenous species of fish and wildlife. Natural processes will be allowed to occur in wilderness ecosystems, which include fish and wildlife populations, as far as possible without human influences. Management will protect the conditions that allow natural processes a maximum degree of freedom.

To the extent possible, wildlife species in BLM wilderness should be allowed to maintain a natural balance with their habitat and with each other. Wildlife may be harvested under State regulations, fisheries management will be consistent with preservation of the area's wilderness character, and direct fish and wildlife control measures will be applied only upon a showing of need under standards described below.

The BLM, in cooperation with State and Federal public health and fish and game officials, may make special exceptions, where necessary to control disease epidemics or other health hazards in which wildlife species are involved as carriers.

The basic responsibilities of the BLM and other cooperating State and Federal agencies in the management of fish and wildlife are not altered by the Wilderness Act. However, the constraints of the Act and the intent of the Congress articulated in the Act and in subsequent legislation will guide the management of wildlife in wilderness. Memoranda of Understanding will be developed with appropriate State game and fish agencies to clarify wildlife management jurisdictions. Wilderness Management Plans will specify wildlife habitat conditions to be maintained. Development of management plans will fully involve all Federal, State, and local agencies and organizations in the formation of management direction.

The preservation of sensitive, rare, threatened, and endangered species dependent on wilderness conditions will be favored.

The killing of native birds and mammals which are a natural component of the biotic community, but are not provided protection by State or Federal law, will be discouraged or controlled if necessary through public education and Memoranda of Understanding with State game and fish agencies.

1. Hunting and Fishing

Hunting and fishing are permitted in BLM-administered wilderness, subject to applicable State and Federal laws and regulations. Coordination with State game and fish agencies for the management of resident wildlife and fish species will be sought in order to ensure maintenance of the wilderness resource. Specific management criteria may be cited in Memoranda of Understanding and the Wilderness Management Plan.

2. Fish and Wildlife Habitat

The proper balance of fish and game animals with their habitat may be achieved by managing public hunting and fishing. Objectives for the management of fish and wildlife habitat are normally compatible with the objectives for maintaining general wilderness character, or careful planning usually can make them so. Where incompatible, the requirements for maintenance of wilderness values will be overriding.

Vegetative manipulation projects for fish and wildlife purposes may be approved by the State Director on a project-by-project basis if they do not degrade wilderness character, or if they correct conditions which are a result of human influence, or if the project will promote the perpetuation of a threatened or endangered species.

Habitat manipulation by chemical or mechanical means may only be approved on a project-by-project basis where necessary for threatened or endangered species, or to correct unnatural conditions resulting from human influence. Such activities will be allowed only where manipulation would enhance the wilderness resource and where natural processes have been unsuccessful. Hand or aerial seeding of native vegetation species may be permitted after disturbances, such as wildfire, to restore essential food plants to a wilderness where the natural process of

healing is not expected to occur. Actions of this type will be allowed only to enhance wilderness values and not to optimize habitat needs of any single wildlife species to the detriment of wildlife diversity in an untrammelled environment.

Wildfire or prescribed burning may be used as a wildlife management tool if carefully designed to maintain or enhance the wilderness resource. Wildfire or prescribed burning is to be used only when the project can be accomplished without serious or long-lasting damage to watershed or the area's wilderness character. Prescribed burning will not be permitted to improve wildlife utilization. It may be done only for the following purposes:

- a. It is needed to maintain the natural condition of a fire-dependent ecosystem or to re-introduce fire where past strict wildfire control measures have interfered with natural ecological processes.
- b. A primary value of a given wilderness will be sustained as a result of the burning.
- c. It will promote the perpetuation of a threatened or endangered species.

Additional specific guidelines on prescribed burning appear in section III. E, Fire Management.

The BLM may authorize State and Federal agencies to use temporary enclosures and facilities to trap or transplant wildlife as long as they are the minimum necessary to protect or maintain the wilderness resource.

Although construction of facilities to enhance an area's value for wildlife or fish is not consistent with the free operation of natural processes, there are situations where such measures may be necessary for the continued existence or welfare of wildlife or fish living in wilderness. This is particularly true in the case of species adversely affected through human activities in such areas. Certain permanent installations to maintain conditions for wildlife and fish, upon consideration of their design, placement, duration, and use, may be permitted if the resulting change is compatible with preservation of wilderness character and is consistent with wilderness management objectives for the area, and if the installations are the minimum necessary to accomplish the task. Permissible actions under these criteria may include: installations to protect sources of water on which wildlife depend, such as enclosures; and water sources such as springs, wells, and guzzlers. Fisheries activities may be permitted as long as their purpose is to protect natural conditions, restore deteriorated habitat, and maintain wilderness values.

3. Wildlife Manipulation

In some instances, wildlife species once native to the wilderness have been forced from their original habitat by the encroachment of human beings and human activities. To the extent that these factors can be altered or managed within the intent of the Wilderness Act, native species no longer established in the wilderness area may be reintroduced and managed as a part of the wilderness resource. Care must be exercised to be certain that the species is native. Such

programs will be addressed in the wilderness management plan.

Management of established exotic species (e.g., chukar partridge, pheasant) not natural to an area may continue where they enhance the wilderness character of a particular wilderness. Introduction of new exotics will not be permitted. Coordination with State and Federal agencies should be established for control of undesirable exotic populations.

4. Fish Stocking

Fish-stocking programs needed to meet wilderness management objectives shall be developed in cooperation with the State agencies or the Fish and Wildlife Service and shall be coordinated with overall wilderness management objectives. The probability of increased visitor use at stocked waters and the full impact and effect of such use on the wilderness resource will be recognized and considered.

Memoranda of Understanding with State agencies should be developed to establish a stocking policy for each wilderness where stocking is permitted, as a basis for a stocking plan. Basic decisions will be spelled out in the wilderness management plan for each wilderness. Aerial stocking of fish by State agencies or the Fish and Wildlife Service may continue where this was an established practice prior to designation. Authorization will be on a case-by-case basis. Aerial stocking should be done outside of general visitor use seasons when possible. Wilderness management plans should contain all necessary justification, mitigation, and definition of planting programs.

Some general guides for fish stocking in BLM wilderness units are:

- a. Native species should be favored in waters with a history of supporting such species. Species native to the vicinity or region may be considered as an alternative. Exotic fish will not be considered, except where such practice existed prior to wilderness designation and it meets wilderness management objectives.

- b. Waters with established undesirable fish or where overpopulations of fish have occurred should be managed for fish best suited to the water under natural conditions, and to meet wilderness management objectives. Barren waters may be stocked only if the wilderness management plan defines the desirability of such an action. The scientific value of barren lakes will be considered prior to approval to stock.

- c. Presently nonstocked waters which at one time supported a native fish population, and which would provide suitable habitat for native fish species that would enhance the wilderness experience of visitors, may be considered for stocking on a case-by-case basis.

- d. In all fish-stocking activities, threatened or endangered species shall receive primary consideration.

5. Trapping

Trapping of furbearers, such as mink, marten, beaver, and muskrat, is a compatible wilderness use and will be allowed under State laws and regulations. Commercial trapping will not be permitted. Incidental trapping, if it is not the trapper's sole source of livelihood, is permitted.

6. Rodents

Rodents in BLM-administered wilderness areas shall be exempt from control programs, except where overpopulations pose a serious threat to other wilderness values or resources and property outside the boundaries of the wilderness. Control projects must be approved on a case-by-case basis.

7. Predators

Predacious animals are an important part of natural life systems within wilderness. They play an important role in the natural selection and survival processes, helping to maintain critical population balances of wild species. They should be able to survive and compete with other species, free from unregulated human interference and the traditional pursuit of sport or bounty. Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it will be accomplished by methods which are directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns are not compatible. Control programs will be carried out by or under the direction of the U.S. Fish and Wildlife Service (FWS), the BLM, or State agencies, and will be consistent with the Secretary of the Interior's policies on animal damage control and with the Memorandum of Understanding between the BLM and FWS. Programs will comply with BLM Animal Damage Control plans where these have been previously adopted. The State Director will approve predator-control programs on a case-by-case basis, and under such conditions as to ensure minimum disturbance to the wilderness resource and visitors.

Approval of predator control actions must be contingent upon a clear showing that the removal of the offending predators will not diminish the wilderness values of the area, because this kind of wildlife is an integral part of the wilderness, as well as an adjunct to the visitor's experience.

III. E. Fire, Insect, and Disease Management

1. Fire Management

a. Overriding Fire Guidance

All fires will be controlled to prevent loss of human life or property within wilderness areas or to prevent the spread of fire to areas outside of the wilderness where life, resources, or property may be threatened. Human-caused wildfires will be prevented and/or controlled unless the fire meets wilderness fire management objectives.

b. Natural Fire

Natural fire (i.e., lightning-caused) is normally a part of

the ecology of the wilderness, and human efforts to ban this agent may have resulted in significant ecological changes in the flora and fauna of some areas. In order to return some wilderness ecosystems to a more natural state, it may be appropriate to allow natural fire to burn, but only in conformance with an approved Fire Management Plan and the overriding fire guidance in section (a) above.

c. Prescribed Burning

Where natural fire under prescription does not meet wilderness fire management objectives, prescribed burning with ignition by Bureau personnel may be allowed on a case-by-case basis for the following purposes:

(1) To reintroduce or maintain the natural condition of a fire-dependent ecosystem.

(2) To restore fire where past strict fire control measures had interfered with natural, ecological processes.

(3) Where a primary value of a given wilderness will be perpetuated as a result of the burning, or

(4) Where it will perpetuate a threatened or endangered species.

Prescribed fires will be allowed only in conformance with an approved Fire Management Plan. State Director approval is required.

d. Removal of Evidence of Fire Control Activities

Temporary fire camps, helispots, and other sites used for fire suppression or control activities shall be removed upon completion of use and the site rehabilitated to as natural a state as possible.

e. Fire Detection

Fire detection methods necessary to meet wilderness objectives will be used. Structures such as lookouts may be maintained or constructed if they are the minimum necessary to achieve wilderness management objectives and there is no other alternative detection method. Preference will be given to detection methods which have the least permanent impact on wilderness values, such as aircraft overflights and lookouts located outside the wilderness boundary.

f. Pre-Suppression

Pre-suppression activities may be allowed to meet wilderness management objectives and where necessary for the protection of the public health or safety. All pre-suppression programs will be addressed in the Fire Management Plan.

g. Suppression

Fire-suppression measures and techniques shall be used which achieve the wilderness management objectives with the minimum adverse impact on the wilderness resource. Preference shall be given to the methods and equipment which least alter the landscape or disturb the land surface. Structures and improvements shall be located outside the wilderness boundary, except those that are the minimum necessary to achieve wilderness management objectives.

h. Fire Management Plans

The following considerations will be covered in each Fire Management Plan: wilderness management objectives for the area, historic fire occurrence, natural role of fire, proposed degree of suppression, ex-

pected fire behavior, acceptable suppression techniques, smoke management, and effects on adjacent landowners. The plan will conform to criteria established by the BLM defining the limits of acceptable fire weather, fire behavior, and fire effects. Each Fire Management Plan will be written to conform to the Wilderness Management Plan (WMP) for the area it addresses and will become an addendum to the WMP upon approval.

2. Control of Insects and Diseases

Insect and disease outbreaks will not be artificially controlled, unless it is necessary to protect timber or other valuable resources outside of the wilderness area, or in special instances when loss to resources within a wilderness is undesirable (e.g., absence of control would threaten rare or endangered plants or animals). Such control measures will consist of the effective combination of actions which have the least adverse impact on the wilderness resource.

Special care must be taken when using chemicals or other artificial methods to control insect and disease outbreaks because of their possible adverse effect on the total biological community.

Insect or disease suppression projects in BLM wilderness must be approved by the Director.

III. F. Water Resource Management

1. Watershed Restoration

Watershed restoration may be undertaken where deteriorated soil and hydrologic conditions caused by human beings or human influences create a serious threat or loss of wilderness values; or where, even though not human-caused, these conditions present a definite hazard to life or property, or where such conditions could cause serious depreciation of important environmental quality outside the wilderness. Where such dangers are not imminent or where natural vegetation may be expected to return in a reasonable time, restoration work will not be done.

Re-establishment of vegetation as a watershed-restoration measure, where there is no reasonable expectation of natural healing, will be accomplished using native or naturalized species. Overland motorized equipment will not be used where more primitive equipment can accomplish the restoration objectives. Exceptions must be fully justified, based upon serious imminent threat to high downstream values. Approval by the Director is required for all watershed restoration proposals.

2. Water Improvements

a. Water-yield Improvements

Protection of wilderness values and management objectives generally preclude use of water-yield improvement techniques. Water-yield improvement prescriptions, if contemplated, must be clearly compatible with maintenance of the wilderness resource. The Director's approval is required for project approval.

b. New Water-Development Structures

The establishment of new water-regulating structures,

power installations, and related improvements is subject to approval by the President. (Range and wildlife water-development structures are discussed under separate subheadings and are not subject to Presidential approval.)

The BLM's conclusions and recommendations in connection with proposals for new water-resource developments will be based upon comprehensive, factual information developed by an environmental analysis, and draft and final environmental impact statements, as prescribed by the National Environmental Policy Act. The final environmental impact statement requires the Director's approval. Any recommendation in favor of the proposal must be based upon a clear showing that the public values to be gained exceed the values that would be lost, and that the need cannot be met outside the wilderness. When a proposed structure is thus found to be in the public interest, consideration should also be given to a recommendation to exclude the applicable area from wilderness.

c. Existing Structures

Reservoirs, ditches, catchments, and related facilities for the control or use of water may have existed within BLM wilderness under valid permits or other authority prior to the area's designation as wilderness. These may be maintained if they are needed in the public interest, or are a part of a valid existing right.

Routine maintenance and repair of an existing structure which does not change the location, size or type, or increase the original intended storage capacity of a reservoir may be approved by the State Director. The operation, maintenance and repair of such facilities may include occasional motorized access where no other reasonable or practical alternatives exist.

Reconstruction of any structure or restoration of a natural body of water to its original or historic level must be approved by the State Director. Primitive means of transport and hand tools will be used wherever and whenever feasible.

Any proposal to increase the storage capacity of a reservoir, or replace a reservoir, which was not under a valid permit at the time the unit was incorporated into the National Wilderness Preservation System, will be considered as a new structure and subject to approval by the President.

The wilderness management plan should carefully evaluate each improvement to determine if the continuation of the use is needed in the public interest, or is part of a valid existing right. Maintenance needs and methods must be specifically stated if the improvement is to remain. If not, the improvement should be allowed to deteriorate naturally. When natural processes themselves cannot effectively and safely return the abandoned improvement back to a natural condition, restoration by other means may be used. Only hand labor and tools, and seeding with native or naturalized species may be permitted. All restoration projects are subject to approval by the State Director.

d. Snow Measurement

The measurement of snow within BLM wilderness is permitted under the following conditions:

(1) Measurement of snow will be accomplished by primitive means. If use of a helicopter was an established practice in measuring snow within an area prior to wilderness designation, that same use may be permitted. However, ways and means of eliminating the need will be explored.

(2) No new data sites can be established unless they are parts of projects approved by the President under provisions of Section 4(d)(4) of the Wilderness Act. Use of existing data sites may continue until adequate correlation can be established with data sites outside the wilderness. Installation of automated equipment (sensing devices, data collection platforms, etc.) may be permitted on a temporary basis at existing data sites to accelerate the development of correlations with data sites outside the wilderness. Access will be by primitive means except as specifically provided for in (1) above.

(3) Only miniaturized and unobtrusive types of equipment may be installed, and must be camouflaged to blend with the terrain as much as possible. Practices such as burying equipment and using antennae which can be removed during nonuse periods, will be used to minimize the visual impacts of the data site.

e. Water Quality

Maintaining or enhancing water quality is of high priority in management of the wilderness resource. Water quality monitoring instruments and hydro-meteorological devices may be permitted if these are the minimum necessary for protection of the wilderness resource. All instruments and devices must be miniaturized and unobtrusive. No motorized vehicles will be permitted for installation, maintenance, or monitoring and surveillance.

f. Weather Modification Over Wilderness

Use of lands within the National Wilderness Preservation System as target areas for weather modification activities will not be approved unless the following conditions are met:

(1) The proponent can provide reasonable, scientifically supportable assurance that the activities will not produce permanent, substantial changes in natural conditions.

(2) The proposal does not include any feature that might reasonably be expected to produce conditions incompatible in appearance with the wilderness environment or reduce its value for recreation, scenic, scientific, education, conservation, or historical use.

The effects of weather modification activities may be permanent or temporary depending upon the type, duration, and degree of change in weather brought about by that activity.

Generally, short-term weather-modification activities, which will produce only occasional, incidental, temporary, or transitory changes in the weather with carryover effects on the ground lasting only a few days beyond the actual seeding period, can be permitted over wilderness because little or no perma-

nent, identifiable ecological or physical impact is likely. Conversely, long-term weather modification programs, which will produce a repeated or prolonged change in the weather during any part of successive years, are likely to have a direct and often substantial impact in terms of ecological and physical effects. Even though the human contribution to these impacts on the ecology and physical conditions on the ground may be obscured by the fact that the activities are carried on outside or above the wilderness, they nevertheless can be recognized to be the result of human activities and therefore cannot be permitted where they will directly affect wilderness areas.

State Directors will gather necessary information relative to items 1 and 2 and make recommendations to the Director on any activity or application. The Director will approve activities or installations relative to weather modification affecting wilderness.

III. G. Air Quality

Under the Clean Air Act (as amended, 1977), BLM-administered lands were given Class II air quality classification, which allows moderate deterioration associated with moderate, well-controlled industrial and population growth. The BLM will manage designated wilderness areas as Class II unless they are reclassified by the State as a result of the procedures prescribed in the Clean Air Act (as amended, 1977).

According to the Clean Air Act, air quality reclassification is the prerogative of the States. The States must follow a process mandated by the Clean Air Act Amendments of 1977, involving a study of health, environmental, economic, social, and energy effects, a public hearing, and a report to the Environmental Protection Agency.

Administrative actions within wilderness areas will comply with the air quality classification for that specific area.

III. H. Rangeland Management

1. Livestock Grazing Operations

Section 4(d)(4)(2) of the Wilderness Act provides for continued livestock grazing where established prior to designating the area as wilderness. The objective of livestock management in wilderness is:

Utilize the forage resource in conformity with established wilderness objectives for each area and the BLM grazing regulations (43 CFR 4100), and through practical, reasonable, and uniform application of the congressional guidelines and policy.

Further insight on the subject is in the Conference Report on S.2009 (House Report 96-1126) under the heading "Grazing in National Forest Wilderness Areas." These congressional guidelines and policy are to be considered in the overall context of the purposes and direction of the Wilderness Act and will be applied nationwide. They are reprinted here verbatim as an excerpt from House Report 96-1126:

Grazing in National Forest Wilderness Areas

Section 4(d)(4)(2) of the Wilderness Act states: "the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture."

The legislative history of this language is very clear in its intent that livestock grazing, and activities and the necessary facilities to support a livestock grazing program, will be permitted to continue in National Forest wilderness areas, when such grazing was established prior to classification of an area as wilderness.

Including those areas established in the Wilderness Act of 1964, Congress has designated some 188 areas, covering lands administered by the Forest Service, Fish and Wildlife Service, National Park Service and Bureau of Land Management as components of the National Wilderness Preservation System. A number of these areas contain active grazing programs, which are conducted pursuant to existing authorities. In all such cases, when enacting legislation classifying an area as wilderness, it has been the intent of the Congress, based on solid evidence developed by testimony at public hearings, that the practical language of the Wilderness Act would apply to grazing within wilderness areas administered by all Federal agencies, not just the Forest Service. In fact, special language appears in all wilderness legislation, the intent of which is to assure that the applicable provisions of the Wilderness Act, including Section 4(d)(4)(2), will apply to all wilderness areas, regardless of agency jurisdiction.

Further, during the 95th Congress, Congressional committees became increasingly disturbed that, despite the language of section 4(d)(4)(2) of the Wilderness Act and despite a history of nearly 15 years in addressing and providing guidance to the wilderness management agencies for development of wilderness management policies, National Forest administrative regulations and policies were acting to discourage grazing in wilderness, or unduly restricting on-the-ground activities necessary for proper grazing management. To address this problem, two House Committee on Interior and Insular Affairs Reports (95-620 and 95-1321) specifically provided guidance as to how section 4(d)(4)(2) of the Wilderness Act should be interpreted. This guidance appeared in these reports as follows:

Section 4(d)(4)(2) of the Wilderness Act states that grazing in wilderness areas, if established prior to designation of the area as wilderness, "shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture". To clarify any lingering doubts, the committee wishes to stress that this language means that there shall be no curtailment of grazing permits or privileges in an area simply because it is designated as wilderness. As stated in the Forest Service regulations (36 CFR 293.7), grazing in wilderness areas ordinarily will be controlled under the general regulations governing grazing of livestock on National Forests. . . . This includes the establishment of normal range allotments and allotment management plans. Furthermore, wilderness designation should not prevent the maintenance of existing fences or other livestock management improvements, nor the construction and maintenance of new fences or improvements which are consistent with allotment management plans and/or which are necessary for the protection of the range.

Despite the language of these two reports, RARE II hearings and field inspection trips in the 96th Congress have revealed that National Forest administrative policies on grazing in wilderness are subject to varying interpretations in

the field, and are fraught with pronouncements that simply are not in accordance with Section 4(d)(4)(2) of the Wilderness Act. This had led to demands on the part of grazing permittees that section 4(d)(4)(2) of the Wilderness Act be amended to clarify the intentions of Congress. However, because of the great diversity of conditions under which grazing uses (including different classes of livestock) are managed on the public lands, the Conferees feel that the original broad language of the Wilderness Act is best left unchanged. Any attempts to draft specific statutory language covering grazing in the entire wilderness system (presently administered by four separate agencies in two different Departments) might prove to be unduly rigid in a specific area, and deprive the land management agencies of flexible opportunities to manage grazing in a creative and realistic site specific fashion.

Therefore, the conferees declined to amend section 4(d)(4)(2) of the Wilderness Act, agreeing instead to reaffirm the existing language and to include the following nationwide guidelines and specific statements of legislative policy. It is the intention of the conferees that the guidelines and policies be considered in the overall context of the purposes and direction of the Wilderness Act of 1964 and this Act, and that they be promptly, fully, and diligently implemented and made available to Forest Service personnel at all levels and to all holders of permits for grazing in National Forest Wilderness areas:

1. There shall be no curtailments of grazing in wilderness areas simply because an area is, or has been designated as wilderness, nor should wilderness designations be used as an excuse by administrators to slowly "phase out" grazing. Any adjustments in the numbers of livestock permitted to graze in wilderness areas should be made as a result of revisions in the normal grazing and land management planning and policy setting process, giving consideration to legal mandates, range condition, and the protection of the range resource from deterioration.

It is anticipated that the numbers of livestock permitted to graze in wilderness would remain at the approximate levels existing at the time an area enters the wilderness system. If land management plans reveal conclusively that increased livestock numbers or animal unit months (AUMs) could be made available with no adverse impact on wilderness values such as plant communities, primitive recreation, and wildlife populations or habitat, some increases in AUMs may be permissible. This is not to imply, however, that wilderness lends itself to AUM or livestock increases and construction of substantial new facilities that might be appropriate for intensive grazing management in non-wilderness areas.

2. The maintenance of supporting facilities, existing in an area prior to its classification as wilderness (including fences, line cabins, water wells and lines, stock tanks, etc.), is permissible in wilderness.

Where practical alternatives do not exist, maintenance or other activities may be accomplished through the occasional use of motorized equipment. This may include, for example, the use of backhoes to maintain stock ponds, pickup trucks for major fence repairs, or specialized equipment to repair stock watering facilities. Such occasional use of motorized equipment should be expressly authorized in the grazing permits for the area involved. The use of motorized equipment should be based on a rule of practical necessity and reasonableness. For example, motorized equipment need not be allowed for the placement of small quantities of salt or other activities where such activities can reasonably and practically be accomplished on horseback or foot. On the other hand, it may be appropriate to permit

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the occasional use of motorized equipment to haul large quantities of salt to distribution points. Moreover, under the rule of reasonableness, occasional use of motorized equipment should be permitted where practical alternatives are not available and such use would not have a significant adverse impact on the natural environment. Such motorized equipment uses will normally only be permitted to those portions of a wilderness area where they had occurred prior to the area's designation as wilderness or are established by prior agreement.

3. The replacement or reconstruction of deteriorated facilities or improvements should not be required to be accomplished using "natural materials", unless the material and labor costs of using natural materials are such that their use would not impose unreasonable additional costs on grazing permittees.

4. The construction of new improvements or replacement of deteriorated facilities in wilderness is permissible if in accordance with those guidelines and management plans governing the area involved. However, the construction of new improvements should be primarily for the purpose of resource protection and the more effective management of these resources rather than to accommodate increased numbers of livestock.

5. The use of motorized equipment for emergency purposes such as rescuing sick animals or the placement of feed in emergency situations is also permissible. This privilege is to be exercised only in true emergencies, and should not be abused by permittees.

In summary, subject to the conditions and policies outlined above, the general rule of thumb on grazing management in wilderness should be that activities or facilities established prior to the date of an area's designation as wilderness should be allowed to remain in place and may be replaced when necessary for the permittee to properly administer the grazing program. Thus, if livestock grazing activities and facilities were established in an area at the time Congress determined that the area was suitable for wilderness and placed the specific area in the wilderness system, they should be allowed to continue. With respect to areas designated as wilderness prior to the date of this Act, these guidelines shall not be considered as a direction to re-establish uses where such uses have been discontinued.

It is also the understanding of the conferees that the authorizing Committees intend to closely monitor the implementation of the guidelines through subsequent oversight hearings to insure that the spirit, as well as the letter, of the guidelines are adhered to by the Forest Service. Of course, the inclusion of these guidelines in this Joint Statement of Managers does not preclude the Congress from dealing with the issue of grazing in wilderness areas statutorily in the future.

This concludes the excerpt from House Report 96-1126.

a. Management Plans

The above congressional guidelines and policies will be applied in accordance with the environmental analysis process. Management prescriptions will be determined through the BLM resource management planning process and implemented by the allotment management plan.

Planning for livestock grazing operations in designated wilderness will be through the normal BLM resource management planning processes.

(1) Resource management plans establish:

(a) Objectives and prescriptions for manage-

ment of wilderness. These are based on resource inventory data which includes, but is not limited to, ecosystem identification, rangeland conditions, existing uses, and areas of existing or potential conflict.

(b) Use levels of the rangeland resource and its relationship with other uses.

(2) Allotment management plans, within the direction established by the resource management plan, prescribe:

(a) The manner and extent to which livestock grazing will be conducted to meet wilderness objectives, rangeland resource needs, desired conditions of ecosystems, and other resource values.

(b) Direction and scheduling for accomplishing goals and objectives on individual allotments, including the development of rangeland improvement schedules and grazing system to be followed.

b. Permits.

Grazing operations within wilderness areas will be authorized by grazing permits. Permits for livestock operations will be issued only in areas where grazing was established at the time the wilderness was designated.

c. Rangeland Analysis

(1) Rangeland analysis in wilderness areas will follow the normal BLM standards.

(2) The development of the allotment management plan will determine the need for and standards of rangeland improvements and will prescribe the grazing system to be followed.

Where an approved allotment management plan exists at the time an area is designated as wilderness, it will be reviewed in context with the congressional guidelines and policy. Necessary modification will be integrated into the resource management plan and the allotment management plan.

Allotment management plans for allotments partially or entirely within designated wilderness will specifically identify the following:

(a) The use of motor vehicles, motorized equipment or other forms of mechanical equipment including: specific equipment, where it is to be used, when it is to be used, and what it is to be used for.

(b) Rangeland improvement structures and installations to be maintained, constructed, or reconstructed in achieving rangeland management objectives, including maintenance standards.

(c) The means to handle emergencies. In bonafide emergencies or urgent situations, decisions will be based on consideration of all relevant factors and use of good judgment.

d. Rangeland Improvements.

The following criteria should be considered in determining the use of motor vehicles, motorized equipment or mechanical transport in constructing, maintaining or applying rangeland improvements and practices.

(1) Minimizing threat to or loss of property.

(2) Minimum use of motorized equipment within wilderness.

(3) Develop and manage the rangeland resource in a cost-effective manner.

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(4) Achieve least amount of impact by non-conforming uses on wilderness values through:

(a) Scheduling during periods of low use.
(b) Harmonizing improvements to surrounding landscape.

(c) Locate improvements to achieve maximum screening and fully utilize natural feature opportunities.

(5) Type of practice or construction material.

(6) Timeliness, including frequency and time of year.

(7) Need to deal with emergency or urgent situations that develop through acts of nature, such as drought, heavy snow.

(8) Location of nearest ranch facilities in relation to the project.

(9) Availability of primitive transport, e.g., team and wagon, saddle and pack stock, etc.

(10) Length of time to complete a project by alternative methods.

(11) Availability of temporary camp and feed sites.

(12) Age and health factors of permittee.

Documentation of the environmental analysis which considers the authorization of rangeland improvement construction and/or maintenance, and the use of motor vehicles, motorized equipment, and mechanical transport shall be made in an environmental assessment.

e. Structural Rangeland Improvements

Rangeland improvement alternatives will be developed and evaluated through the environmental analysis process, including consultation with grazing permittees and other interested publics. Alternatives which utilize a practical and reasonable approach to meet rangeland and wilderness management objectives will be selected.

Permit modifications for the construction of new rangeland improvements or replacement of existing rangeland improvements will be made in accordance with BLM grazing regulations. Special consideration will be given to construction standards and techniques to achieve the most practical and reasonable approach considering the wilderness resource. Specific consideration will be given to:

- Costs of using natural materials.
- Alternative means of construction which harmonize to the extent possible with the wilderness resource.
- Use of motor vehicles, motorized equipment or mechanical transport needed for construction of improvements.

All rangeland improvements will be listed in the allotment management plan along with maintenance schedules.

(1) Maintenance.

The maintenance of existing necessary rangeland improvements may be allowed to continue. Those determined unnecessary through an environmental

analysis will be phased out and removed on an agreed upon schedule.

The techniques by which maintenance of rangeland improvements and other related grazing activities are performed will require careful study, consideration of options, and a practical and reasonable solution. Existing use and requests for new use of motor vehicles, motorized equipment or other forms of mechanical transport, including emergencies, will be reviewed and congressional grazing guidelines applied. The occasional use of motor vehicles, motorized equipment or mechanical transport may be permitted where practical alternatives are not available.

The guidelines address occasional use of motor vehicles, motorized equipment, or mechanical transport where practical alternatives do not exist, with application only to those portions of a wilderness where they occurred prior to wilderness designation. It is important to look at all options and their impacts. Good judgment will be necessary in the decisionmaking process.

(2) New Improvements.

The construction of new rangeland improvements is permissible if determined to be necessary for the purpose of resource protection (rangeland and/or wilderness) and the effective management of these resources, rather than to accommodate increased numbers of livestock. The rangeland analysis may indicate that a reduction of use is necessary for rangeland protection, or new rangeland improvements are necessary for improved management or protection of wilderness values. New improvements will not be justified solely on the basis that they will aid intensive management resulting in increased grazing.

(3) Types of Materials.

When permitted, new or existing improvements should be of materials which harmonize with the wilderness character of the area to reduce the impact of artificial objects on the natural environment. Natural (native) materials for improvements will be used unless costs are unreasonable or they do not harmonize with the wilderness.

When replacement of an existing range improvement is contemplated, the following will be considered:

(a) The necessity of the rangeland improvement for livestock grazing operations, resource protection, or enhancement of wilderness values. Some improvements may no longer be needed or should be relocated. Existing rangeland improvements may be necessary for management of the rangeland and wilderness resources. Other alternatives for meeting needs will be explored.

(d) Design, location, and type of materials feasible to serve the purpose and yet be harmonious with natural features of the wilderness will be considered. A steel post and wire fence may be less obtrusive than native pole fence. A redwood water trough may be less noticeable than a steel one. A windmill may better harmonize with wilderness values than an earthen stock pond.

(c) Material and labor costs for natural materials vs. artificial materials. Good judgment, in

consultation with permittees, will provide the basis for determining what is reasonable for the permittee's livestock grazing operation and the particular wilderness values involved.

f. Non-Structural Rangeland Improvements

Non-structural rangeland improvement practices can be approved where they were part of the management at the time the wilderness was established and where their continuance is necessary to maintain livestock grazing operations. The need for non-structural rangeland improvements and practices will be carefully analyzed using the following criteria:

(1) Seeding.

The need for seeding will be carefully analyzed. Seeding will be approved only for:

(a) Areas where human activities have caused the loss or threaten the existence of indigenous species.

(b) Areas where human activities have denuded or caused loss of soil, providing the actions or activities responsible for the deterioration have been corrected and natural vegetation is insufficient and ineffective.

(c) Maintenance of livestock grazing operations where seeding was practiced prior to the designation of wilderness. Species seeded will be those that are native or naturalized to the area. Seed will be broadcast, except in special situations where other seeding methods are necessary.

(2) Plant Control.

Plant control will be approved only for:

(a) Native plants when needed to maintain livestock grazing operations where practiced prior to the designation of wilderness.

(b) Noxious farm weeds by grubbing or with chemicals when they threaten lands outside wilderness or are spreading within the wilderness, provided the control can be effected without serious adverse impacts on wilderness values.

(3) Irrigation.

Artificial irrigation or water spreading will be done only to maintain livestock grazing operations where practiced prior to the designation of wilderness.

(4) Fertilizing.

Fertilization may be used only as an aid to revegetation of disturbed areas approved in item (1) or to maintain livestock grazing operations where practiced prior to the designation of wilderness. Liming will be considered a fertilization practice.

(5) Prescribed Burning.

Prescribed burning will be approved for rangeland management purposes only where it was practiced prior to the designation of wilderness and is necessary to achieve maintenance of livestock grazing operations; such use must be approved in a fire management plan. (Prescribed burning may be permitted for other purposes, under guidelines in section III. D. 2. and III. E. 1 of this document, such as in cases where reestablishment of natural fire regimes is desired. Rangeland management objectives may be achieved through such prescribed burns and through management of natural fire as prescribed in fire management plans.)

2. Recreational Livestock

Commercial recreational livestock, such as that used by packers and outfitters, will be grazed under permit. Noncommercial recreational livestock may also be subject to permit when necessary for the administration or protection of the wilderness. All recreational livestock users, including commercial outfitters, will be required to pack in feed for their domestic animals when it is determined that adequate forage is not available within the area to be visited. The Wilderness Management Plan will analyze the need for regulations or restrictions relating to recreational saddle and pack stock; including, but not limited to, hobbling rather than tethering of horses, restrictive zoning, horse-party size limits, and use of native feed or pellets.

3. Wild Horses and Burros

The Wild Free-Roaming Horse and Burro Act of 1971 declares that wild horses and burros "...are to be considered in the area where presently found, as an integral part of the natural system of the public lands."

Viable, healthy populations of wild horses and burros will be maintained in wilderness areas at levels determined appropriate by the BLM planning system. Herd numbers and management techniques will not degrade, and will be compatible with preservation of, the area's wilderness character.

Herd Management Area Plans (HMAP's) will be developed in wilderness areas containing wild horses or burros. The plans will detail the present condition and potential of the herd and herd management area. The plans will describe management actions required to meet the wilderness objectives as well as the herd needs. The HMAP's will establish the habitat requirements and any necessary improvements; herd structure (sex and age ratios, etc.); methods of population manipulation and control (including removal, if necessary); migratory habits; and projections of population changes over time. Monitoring studies for the herd and its habitat will be an integral part of the plan. The HMAP's will describe the physical improvements necessary for maintenance of healthy, viable herds and their habitat.

Use of motorized and mechanical equipment, including aircraft; use, maintenance and type of material, and equipment such as temporary corrals; and the location, frequency, and timing of such uses will be specified in HMAP's and wilderness management plans. Such uses will be allowed when no other alternatives exist, they are the minimum necessary to accomplish the task, and they are the least degrading of wilderness values temporarily or permanently. Use of these facilities and equipment require State Director approval.

Environmental assessments will analyze the impacts of the management prescribed by the HMAP's, and alternatives and mitigating measures to minimize those impacts upon the wilderness resource.

III. I. Minerals Management

1. Mining Law Administration

The Wilderness Act of 1964 provides the basis for the minerals management policy to be followed in approving minerals exploration and development in designated wilderness areas. The Act recognizes the rights of the mining claimant under the mining laws and provides for prospecting and mining in wilderness while providing for protection of the wilderness resource. Under the Wilderness Act, the mining laws shall, to the same extent as applicable prior to the designation of an area as wilderness, apply until midnight December 31, 1983. Thereafter, subject to valid rights then existing, the lands are withdrawn from all forms of appropriation under the mining laws. Therefore, BLM's policy on mining operations on unpatented mining claims will comprise two categories: those operations occurring on or before midnight December 31, 1983, and those operations occurring after midnight December 31, 1983, which may proceed because they qualify as valid existing rights as of that date.

a. Plans of Operations

(1) Whether or not the operations occur before or after midnight December 31, 1983, an approved plan of operations called for by 43 CFR 3809 is required in all BLM-administered wilderness areas. The plan of operations will include all access, functions, work, facilities, and activities in connection with prospecting, development, extraction, and processing of mineral deposits and all other uses related to these activities whether on or off a mining claim. All BLM officials involved must ensure that provisions approved in operating plans protect the rights of the operator while minimizing the impact on the wilderness resource. Operators must be allowed to carry out operations that are necessary and reasonably incidental to the mining operation, but may not, in any circumstance, cause unnecessary or undue degradation. District Managers may call for the expertise of all necessary specialists to ensure that both the wilderness and the rights of the operator are adequately and properly served.

Before approving the plan the BLM may assist the operator in selecting the most appropriate means and type of access and access route. The final approved access must be that which creates the least lasting impact on the wilderness resource, while still reasonably serving the needs of the operator.

Those activities otherwise generally prohibited in wilderness, including the use of mechanical transport, motorized equipment, or aircraft, shall be authorized only when there is no reasonable alternative. An approved operating plan will serve as authorization for such otherwise prohibited activities on mining claims within wilderness.

Casual use permissible in wilderness areas consists of operations resulting in only negligible disturbance to wilderness resources and not involving the use of mechanical or motorized equipment, landing of aircraft, or explosives. Examples of casual use would be: access by foot or horseback, or overflights to

conduct magnetic surveys. Flights used to transport equipment or personnel into and out of the wilderness will not be considered as casual use. An approved plan of operations is not required for casual use.

(2) Contents of a plan of operations and plan approval procedures shall comply with the 43 CFR 3809 regulations. The following criteria shall also be satisfied:

(a) Operations Prior to Midnight December 31, 1983.

Until this deadline, lands within wilderness areas are open to appropriation under the mining laws to the same extent as before wilderness designation. In other words, claim staking, prospecting, exploration, development, and patenting may occur. Before approving operations submitted in a plan of operations during this time, the District Manager shall be satisfied that:

i. There will be no unnecessary or undue degradation of wilderness character.

ii. If mechanical or motorized equipment, including helicopter and fixed wing aircraft (beyond casual use), will be used, there is no reasonable alternative.

iii. The reclamation measures included in the plan of operations are adequate to provide for resotation as near as practicable of the surface of the land disturbed.

Any disapproval or denial of a plan of operations by the authorized officer is subject to appeal by the operator under the provisions of 43 CFR 3809.4.

(b) Operations After December 31, 1983

Development work, extraction, and patenting will be allowed to continue after midnight December 31, 1983, only on valid claims located on or before that date. After that date, prospecting and exploration work under the mining laws will not be allowed, as the right to continue those kinds of operations terminated on midnight December 31, 1983.

Prior to approving plans submitted after December 31, 1983, for operations on claims, or allowing operations to continue that had been approved prior to midnight December 31, 1983, the District Manager shall cause an examination of the unpatented claim(s) by a BLM minerals examiner to verify whether or not a valid claim exists. Operations on producing mines will be allowed to continue pending determination of valid existing rights. The minerals examination and subsequent minerals report must confirm that as of midnight December 31, 1983, minerals had been found and the evidence is of such a character that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success in developing a valuable mine. Any disapproval or denial of a plan of operations by the authorized officer is subject to appeal by the operator under the provisions of 43 CFR 3809.4.

Before approving a plan of operations applicable after December 31, 1983, the District Manager shall be satisfied that:

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i. There will be no unnecessary or undue degradation of wilderness character.

ii. If mechanical or motorized equipment, including helicopter and fixed wing aircraft (beyond casual use), will be used, there is no reasonable alternative.

iii. The reclamation measures included in the plan of operations are adequate to provide for restoration as near as practicable of the surface of the land disturbed.

(c) **Timber**—Timber determined necessary for removal to facilitate mining activities will be cut following principles of sound forest management and in such a manner as to minimize lasting evidence of its removal. Individual trees will be carefully selected so as not to make obvious artificial openings. Stumps will be cut as close to the ground as practical.

(d) **Fire**—The operator will be required to keep spark arresters and fire extinguishers on all internal combustion engines during periods of fire danger. The operator will generally be required to maintain caches of handtools in sufficient quantities to equip those personnel expected to be on the operation. The operator and his personnel will be expected to take initial action on any fire in the vicinity of the operation.

Slash and other flammable debris will generally require complete disposal to reduce fire hazard, prevent insect buildup, and more rapidly reduce evidence of the timber cutting. If burning is performed it will be in accordance with a prescribed burn plan that establishes fire and resource management objectives. Burning will be performed at a time approved by the BLM District Manager.

(e) **Site Reclamation**—The reclamation of the site and other disturbed areas will vary with the location, type of soil erosion hazard, type of vegetative cover, and type and extent of disturbance. As a minimum, all sites will be treated in such a manner that they will not cause accelerated erosion, siltation of streams, a hazard to wilderness visitors, or unnecessary or undue degradation of the land. Also, as a minimum, all excavations with vertical cuts in soil will be sloped to a stable angle of repose. Generally, hand-dug pits or shafts with the excavated material still at hand will be refilled. Here, as with timber cutting, the main objective will be to minimize remaining evidence of human activities. It may not be practical to return an area to its original contour, but it will generally be entirely reasonable to return it to a contour which might appear to be natural. An effort will be made when practical and reasonable to put topsoil equal in quality to that which was removed over disturbed soil surfaces to promote natural revegetation or to aid in seeding. Where native seed is available and its use is reasonable, disturbed areas will be seeded to native plant species provided the area originally supported such vegetation.

(f) **Structures and Improvements**—Plans of operations shall identify all structures and improvements planned as an adjunct to the operation. The plan will also show the ultimate disposition of the improvements and when this will occur. The objective will be to ensure the removal of all works or

improvements when they are no longer needed for the prospect or future mining.

(g) **Unnecessary or Undue Degradation**—A plan of operations shall include measures to be taken to prevent unnecessary or undue degradation of the area resulting from the proposed operation. This may require measures to prevent water pollution through contamination or siltation of streams while the operation is in progress and to leave the site in such a condition that a vegetative cover can be reestablished when the operation is abandoned. Such measures may include trenching of disturbed slopes, placing retaining walls to prevent tailings from entering stream channels, etc. It may also require the scalping and stockpiling of the topsoil or sod from the area to be disturbed so that it might be spread over the surface to aid in reestablishing vegetation. Air and noise pollution are also critical elements. Plans shall identify mitigating measures to minimize noise and air pollution.

b. Performance Bond

No bond shall be required for operations considered as casual use. A bond may be required for any operator who conducts operations under an approved plan of operations. The primary purpose for a bond is to ensure compliance with the plan of operations. Requirement for posting a bond is at the discretion of the authorized officer.

c. Environmental Assessment

Operating plans for prospecting and mining activities will normally involve surface disturbance of the wilderness resource and will require an environmental assessment which considers the impact of the proposed operation on the lands and all feasible alternatives for complying with the rights of the claimant. Upon completion of the analysis, the District Manager will determine if no environmental impact statement is needed. The State Director's approval is required for preparation of an environmental impact statement.

2. Mineral Leasing

Section 4(d)(3) of the Wilderness Act of 1964 prescribes that mineral exploration and development will continue in designated wilderness areas by stating "until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the same extent as applicable prior to the effective date of this Act, extend to those . . . lands designated by this Act as 'wilderness areas'".

Designation of an area as wilderness may not be the basis for denying a mineral lease, permit, or license. Mineral leasing applications will be evaluated through the environmental assessment process. A State Director's determination to deny an application must be based upon background data and facts of record indicating the public interest would be better served by the rejection so as to protect other resource values. Wilderness character may be taken into account when making mineral leasing decisions, but leases or permits may not be denied solely on the basis of a desire to protect wilderness character. Leases, permits, or licenses issued after an area is designated as wilderness and prior to midnight December 31,

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1983, must contain reasonable stipulations for the protection of the wilderness character of the land consistent with the use of the lands for the purposes for which they are leased, permitted, or licensed.

Mineral leases, permits, or licenses confer certain rights upon individuals to conduct certain activities upon the public lands. Regulations imposed on existing lessees, permittees, or licensees must be reasonable and consistent with the continued use of the lands for the purposes for which the leases, permits or licenses were issued.

Geothermal leasing is within the scope of the "laws pertaining to mineral leasing" in section 4(d)(3) of the Wilderness Act. Designated wilderness areas will remain available for geothermal leasing to the same extent they were at the time of designation, and the above guidelines on mineral leasing will apply.

3. Mineral Patents

A patent conveying both surface and mineral rights may be issued on a valid claim located *prior* to the date the area was included as a part of the National Wilderness Preservation System and prior to midnight December 31, 1983.

Mining locations shall be held and used solely for mining. For a valid claim located *after* the date an area is established as wilderness and prior to midnight December 31, 1983, the patent conveys title to mineral rights only. The patentee may cut and use so much of the mature timber from the claim as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if the timber is not otherwise reasonably available. All timber shall be cut under sound principles of forest management. All surface rights are reserved to the United States. Except as specifically provided in the Wilderness Act or the act designating the area as wilderness, no use of the surface of the claim or its resources not reasonably required for carrying on mining or prospecting shall be allowed.

No patent shall issue after December 31, 1983, except for the valid claims existing on or before midnight December 31, 1983.

Once a claim has been patented it becomes private land or interest in lands. Access will then not be governed by a plan of operations, but under the policy in section III. B. 5. j.

4. Common Varieties of Mineral Materials

Permits to remove such materials will not be issued.

5. Paleontological Resources

To the extent not inconsistent with the concept of wilderness preservation and the intent of the Wilderness Act, paleontological resources are available for recreational, scenic, scientific, educational, conservation, and historical uses. Paleontological resources, in most instances, will be subject to the forces of nature in the same manner as other wilderness resources. Study or management will not normally include any excavation, stabilization, or interpretation activities. Salvage of paleontological sites, excavation, and collection of artifacts may be

permitted on a case-by-case basis where the project will not degrade the overall wilderness character of the area and such activity is needed to preserve the particular resource. State Director approval is required for all such projects.

III. J. Administrative Structures and Facilities

1. Administrative Sites

Existing administrative sites will be limited to the existing structures or their replacement with similar structures of compatible design provided their continued use is necessary to meet minimum requirements for the administration of the area. Tents will usually be used to supplement housing and kitchen demands brought about by special projects and expanding workloads. As maintenance becomes impractical, first consideration will be given to eliminating the site. Replacement of facilities will require the Director's approval. The Wilderness Management Plan will address the need for existing sites. No new sites will be planned unless they are the minimum necessary for management of the area as wilderness.

2. Fences

Corrals and fences for the control of administrative pack and saddle stock may be built only at administrative sites where the animals are regularly used for periods of more than a few days' duration. New permanent fences shall be constructed of materials compatible with the particular wilderness. The Wilderness Management Plan will consider the need for, location of, and material to be used in administrative fence construction.

3. Trails

Trails for administrative purposes may be constructed when they are the minimum necessary for the preservation of the wilderness resource and have been authorized in the Wilderness Management Plan. (Trails and associated structures for visitor use are discussed as part of the specific guidance under Recreation and Visitor Use, section III. A. of this document.)

4. Airfields

New airfields, including emergency airstrips, shall not be located in BLM-administered wilderness. The Wilderness Management Plan shall review existing airstrips and determine whether or not to permit the continued use of existing airfields. Such use will be monitored on a regular basis to determine if its continuation is appropriate. Use may be restricted when necessary to protect wilderness resources, such as wildlife values during nesting season. If use is approved, maintenance will generally be by primitive, non-motorized equipment only.

5. Heliports and Helispots

a. Heliports

Heliports may be constructed and maintained at existing administrative sites where they are the minimum necessary for wilderness purposes. Complete justification for continuing heliports or constructing new ones will be required. Unless otherwise approved by the Director, other heliports shall not be located within wilderness areas. The Wilderness Management

Plan will fully evaluate the need for heliports. Only those heliports considered the minimum necessary for wilderness resource management will be continued.

b. Helispots

State Directors may approve construction of individual helispots or systems of helispots when they are the minimum necessary for administration or protection of the area as wilderness. The Wilderness Management Plan will fully evaluate helispot needs. Except for emergencies, helispot construction is prohibited if not specifically identified in the Wilderness Management Plan.

6. Communication Facilities

Communication facilities will be constructed and maintained only when they are the minimum necessary for administration and protection of the area as wilderness. The Wilderness Management Plan will fully evaluate the need for existing and proposed sites and their maintenance. Facilities should blend with the natural environment.

7. Structures and Facilities Constructed, Used or Proposed by Other Agencies

Other agencies conducting activities within BLM wilderness shall be equally constrained by provisions of the Wilderness Act that are applicable to the BLM. These guidelines will apply:

a. Authorized structures, installations, or facilities used by other agencies shall be reviewed periodically to determine whether their continued existence is essential for meeting the minimum requirements for administration of the area as wilderness. If it is not, the authorization shall be terminated and the improvement removed. The Wilderness Management Plan will assess and determine the disposition of all such improvements.

b. When existing improvements deteriorate to the point that normal maintenance will not suffice to keep them usable, the necessity for such improvements shall be critically analyzed. If they are not essential to meet the minimum requirements of administration of the wilderness, or essential to a continuing program that was established on the basis of the structure, they shall not be replaced. Permits for new improvements or replacement of existing improvements must be approved by the Director.

c. The maintenance or replacement of existing signs, instruments, and other improvements of a minor nature, used in connection with such projects as snow surveys, water measurement, game and fish management, and geological studies may be approved by the State Director. New installations may be approved if they are essential to meet the minimum requirements for administration of the wilderness for the purposes of the Wilderness Act.

III. K. Use of Motorized and Mechanical Equipment

Travel within a BLM-administered wilderness will normally be by non-motorized, non-mechanical means consistent with the preservation of wilderness character.

The wilderness management plan will specify the instances and places in which administrative use of mechanized equipment, mechanical transport, or aircraft is the minimum necessary to protect and administer the wilderness resource or is necessary as part of a nonconforming, but accepted, use. Where approved, that equipment which is the minimum necessary to accomplish the task with the least lasting and damaging impact on the wilderness resource will be selected. Such motorized and mechanical equipment use will be scheduled at times and locations which will have the least impact on the visitors' wilderness experience.

Conditions under which use may be allowed (unless otherwise stated, all use is subject to the standards spelled out in the preceding paragraph) are:

1. The public use of aircraft or motorboats, where these uses were established prior to the area's designation as wilderness, may be permitted to continue. Wilderness Management Plans will assure periodic review of such use to determine if its continuation is necessary and impacts on the area's wilderness character are minimized.

2. Motorized and mechanical equipment use may be authorized for mining or prospecting purposes if approved in a Plan of Operation or in association with valid existing rights. Refer to specific guidance for Minerals Management in section III. I.

3. The use of motor vehicles, motorized equipment, and mechanical transport may be approved for certain situations involving established livestock grazing operations. Refer to specific guidance for Rangeland Management in section III. H.

4. Motorized equipment and mechanical transport use may be allowed when an emergency condition exists which involves the health and safety of visitors. The District Manager (or Area Manager, if delegated) may approve such action.

5. Motorized equipment and mechanical transport may be permitted during a fire suppression emergency. Impacts resulting from overland vehicle travel (either cross-country travel or temporary road construction) and impacts from equipment use will be obliterated and rehabilitated in a manner which permits the wilderness resource an opportunity to heal rapidly. Motorized equipment and mechanical transport uses will be specifically addressed in a wilderness area's Fire Management Plan. The District Manager (or Area Manager, if delegated) may approve such action. Refer to specific guidance for Fire Management.

6. The use of aircraft may be allowed in nonemergency situations to deliver supplies or materials to construct or maintain improvements needed for administration of the area as wilderness when use of pack and saddle stock or other non-mechanized means is not feasible. Approval must be authorized by the State Director.

7. Powered hand-portable tools, such as chain saws or rock drills, may be approved by the State Director when they are the minimum necessary for administrative purposes where work cannot be accomplished with nonpowered tools. (In some cases, such tools

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may be necessary in trail construction and maintenance, due to limitations of time, season, etc.)

8. Mechanized or motorized equipment may be used for wilderness research, other wilderness-enhancing purposes where no other alternatives exist and where such use is the minimum necessary for administration of the area as wilderness and will not degrade the area's wilderness character. Instances could include wildlife transplants or fish stocking by State Divisions of Wildlife. State Director approval is required. (Refer also to specific guidance for Research and Studies.)

9. Mechanized or motorized equipment may be used in gathering information about resources, so long as the use is compatible with preservation of the wilderness environment. Instances could include mineral surveys by the U.S. Geological Survey or water resource investigations. State Director approval is required.

10. Where feasible, control of insects and disease will be conducted without use of motorized equipment. Otherwise, aircraft use is permissible without landing of aircraft. Approval must be authorized by the State Director on a case-by-case basis.

11. Motorized equipment necessary to meet temporary emergencies involving violations of criminal law and/or including the pursuit of fugitives may be approved by the District Manager (or Area Manager, if delegated).

12. There is no specific prohibition of overflight of wilderness by aircraft. Low-flying aircraft cause disturbance of the solitude of an area. Except in bona fide emergencies, such as search and rescue efforts and essential military missions, low flight should be discouraged. Where low overflight is a problem, or

expected to become a problem, wilderness management plans will provide for liaison with proper military authorities, the Federal Aviation Administration, and contact with pilots in the general area in an effort to reduce low flight.

III. L. Research and Studies

Research is a valid and important use of the wilderness resource. Research will be permitted and encouraged as long as all projects are conducted in such a manner as to preserve the area's wilderness character and they further the management, scientific, educational, historical, and conservation purposes of the area.

Research will be conducted or supported to evaluate the effectiveness in achieving objectives of ongoing wilderness management. Research will also be encouraged to identify problems and improve management techniques to increase efforts to further the purposes of the Wilderness Act.

Research and studies to investigate scientific values may also be conducted in wilderness provided that wilderness is essential to results of such research, and wilderness values would not be jeopardized.

Research and other studies will be conducted without use of motorized equipment or construction of temporary or permanent structures. Exceptions to this policy may be approved by the State Director in projects that are essential to management of the specific wilderness when no other feasible alternatives exist. Such use, when approved, must be the minimum necessary and must not degrade the area's wilderness character.

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Under the authority of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701) and the Wilderness Act of 1964 (16 U.S.C. 1131), Subchapter H, Chapter II, Title 43 of the Code of Federal Regulations, is amended by adding a new Group 8500 (consisting of Part 8560) as set forth below:

Dated: February 1, 1985.

J. Steven Griles,

Deputy Assistant Secretary of the Interior.

Group 8500—Wilderness Management

PART 8560—WILDERNESS AREAS

Subpart 8560—Management of Designated Wilderness Areas

Sec.

- 8560.0-1 Purpose.
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- 8560.4-7 Mineral leases and permits.
- 8560.4-8 Water and power resources.
- 8560.5 Penalties.

Authority: 43 U.S.C. 1701 et seq., 16 U.S.C. 1131 et seq.

Subpart 8560—Management of Designated Wilderness Areas

§ 8560.0-1 Purpose.

The purpose of this part is to provide procedures for the management of public land designated by Congress as part of the National Wilderness Preservation System and administered under provisions of the Wilderness Act of 1964.

§ 8560.0-2 Objective.

The objective of these regulations is management of the public lands designated as part of the National Wilderness Preservation System to preserve and protect their wilderness character, provide for their use and enjoyment by the American people in a manner that will leave them unimpaired for future use and enjoyment as wilderness, and allow for recreational, scenic, scientific, educational, conservation and historical use.

§ 8560.0-3 Authority.

This part is issued under the authority of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), and the Wilderness Act of 1964 (16 U.S.C. 1131 et seq.).

§ 8560.0-5 Definitions.

As used in this part, the term:

(a) "Adequate access" means the combination of routes and modes of travel to non-Federal inholdings that will, as determined by the authorized officer, serve the reasonable purposes for which the non-Federal lands are held or used, and at the same time, cause impacts of least duration and degree on their wilderness character.

(b) "Authorized officer" means any employee of the Bureau of Land Management who has been delegated the authority to perform the duties described in this part.

(c) "Bureau" means the Bureau of Land Management.

(d) "Mechanical transport" means (1) any device for transporting personnel or material with wheels, tracks or skids, or by flotation, for traveling over land, water or snow, and is propelled by a nonliving power source contained or carried on or within the device, or (2) a bicycle or hang-glider.

(e) "Motorized equipment" means any machine activated by a nonliving power source except small battery-powered, handcarried devices such as flashlights, shavers, Geiger counters and cameras.

(f) "Motor vehicle" means any vehicle which is self-propelled or any vehicle which is propelled by electric power obtained from batteries.

(g) "Mining operations" means all functions, work and activities in connection with prospecting, exploration, development, mining or processing of mineral resources and all uses of the land reasonably incident thereto, including roads and other means of access on lands subject to the regulations in this part, regardless of whether said operations take place on or off mining claims.

(h) "Primitive and unconfined recreation" means nonmotorized types of outdoor recreation activities that do not require developed facilities.

(i) "Public lands" means any lands and interests in lands owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management without regard of how the United States acquired ownership.

(j) "Solitude" means the state of being alone or remote from habitation;

isolation; also, a lonely, unfrequented, or secluded place.

(k) "Visitor use" means on-site use of the wilderness area for recreation, inspiration, stimulation, solitude, relaxation, education, scientific research, pleasure or satisfaction.

(l) "Wilderness" is defined in the same way as in section 2(c) of the Wilderness Act of 1964, 16 U.S.C. 1131(c).

(m) "Wilderness character or characteristics" are defined in the same way as in section 2(c) of the Wilderness Act of 1964, 16 U.S.C. 1131(c).

§ 8560.0-6 Policy

Wilderness areas shall be managed to promote, perpetuate and, where necessary, restore the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, primitive recreation, watersheds and water yield, wildlife habitat, natural plant communities, and similar natural and recreational values.

(a) Natural ecological succession shall be allowed to operate freely to the extent permitted by the Wilderness Act:

(b) Wilderness shall be made available for human use to the optimum extent consistent with the maintenance of wilderness character;

(c) In resolving conflicts in resource use, wilderness values shall be primary to the extent provided by the Wilderness Act or subsequent establishing legislation.

§ 8560.1 Uses and prohibited acts.

§ 8560.1-1 Permits for and restrictions on use.

(a) Unless otherwise designated by the authorized officer, all wilderness areas shall be open to uses consistent with the preservation of their wilderness character and their future use and enjoyment by the American people as wilderness, including, but not limited to, primitive recreation and scientific study. The authorized officer may require permits for any use of particular wilderness areas, including, but not limited to, camping, campfires and grazing of recreation livestock, and may issue written orders to close or restrict the use of lands and water surface administered by the Bureau within the boundary of any component of the National Wilderness Preservation System when necessary to carry out the provisions of the Wilderness Act. Each order shall:

(1) Describe the lands, trail or waterway to which the order applies;

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(2) Specify the time during which the closure or restriction applies;

(3) State each prohibition that is applied;

(4) Specify the reason for the closure, restriction or prohibition; and

(5) Specify any person exempted from any of the prohibitions contained in the order.

(b) An order to close or to restrict the use of lands and water surface shall be effective upon posting. Posting shall be by:

(1) Placing a copy of the order in each local office of the Bureau having jurisdiction over lands affected by the order, and

(2) Displaying each order near and/or within the affected wilderness area in such reasonable locations and in such a manner as to bring the prohibitions contained in the order to the attention of the public.

(c) The authorized officer may publish in the **Federal Register**, and/or in a newspaper of general circulation in the area of the affected lands, a copy of the order to close or restrict the use of lands or water surface.

(d) Permits may be requested from the Bureau office exercising field-level jurisdiction over the wilderness areas for which use permits are required by the authorized officer.

(e) When a permit for use is required by the authorized officer, applications for recreation uses shall be completed in accordance with the provisions of 43 CFR Part 8372.

§ 8560.1-2 Prohibited acts.

Except as provided in the Wilderness Act or subsequent legislation establishing a particular wilderness area, or as specifically provided for elsewhere in this subpart, and subject to valid existing rights, the following are prohibited in wilderness areas managed by the Bureau;

(a) Commercial enterprises;

(b) Temporary or permanent roads;

(c) Aircraft landing strips, heliports, or helispots;

(d) Use of motorized equipment, motor vehicles, motorboats or other forms of mechanical transport;

(e) Landing of aircraft;

(f) Dropping of materials, supplies or persons from aircraft;

(g) Structures or installations, including motels, summer homes, stores, resorts, organization camps, hunting and fishing lodges, electronic installations, and similar structures and uses;

(h) Cutting of trees;

(i) Violating any order or regulation established by the authorized officer;

(j) Entry into or use of wilderness areas without a permit, where such permits are required by the authorized officer.

§ 8560.2 Special provisions applicable to Alaska (Reserved).

§ 8560.3 Administrative and emergency functions.

To the extent authorized by law, the authorized officer may:

(a) Use, construct or install motorized equipment, mechanical transport, aircraft, aircraft landing strips, heliports, helispots, installations or structures in designated wilderness areas, and prescribe conditions under which such items may be used, transported or installed by other Federal, State or county agencies or their agents, to meet the minimum requirements for protection and administration of the wilderness area and its resources.

(b) Authorize occupancy and use of wilderness areas by officers, employees, agencies or agents of the Federal, State and local governments to carry out the purposes of the Wilderness Act.

(c) Prescribe measures to be taken, as necessary, to control fire, insects and diseases where these threaten human life, property or high value resources within the wilderness area or on adjacent nonwilderness lands.

(d) Prescribe measures which may be used in emergencies involving the health and safety of persons or damage to property, including the conditions for use of motorized equipment, mechanical transport, aircraft, installations and structures.

§ 8560.4 Nonconforming uses.

All uses specifically permitted in wilderness areas by the Wilderness Act and subsequent laws shall be conducted in a manner that will preserve the wilderness character of the land, except as otherwise provided in the Wilderness Act and this Part.

§ 8560.4-1 Livestock grazing.

(a) The grazing of livestock, where such use was established before the date of the establishment of the area as a unit of the National Wilderness Preservation System, shall be permitted to continue under the regulations on the grazing of livestock on public lands in part 4100 of this chapter and in accordance with any special provisions covering grazing use in wilderness areas that the Director may prescribe.

(b) Grazing activities may include the construction, use and maintenance of livestock management improvements and facilities associated with grazing that are in compliance with wilderness

area management plans provided for in the Wilderness Management Policy (46 FR 47180, September 24, 1981) approved by the authorized officer.

§ 8560.4-2 Aircraft and motorboats.

The authorized officer may permit the landing of aircraft and use of motorboats at places within any wilderness area where these uses were established before the date the area was designated by Congress as a unit of the National Wilderness Preservation System, and where such uses have continued, subject to such restrictions as he/she finds necessary. The authorized officer may also permit the maintenance of aircraft landing strips, heliports or helispots that existed when the area was designated a unit of the National Wilderness Preservation System.

§ 8560.4-3 Access.

(a) States or persons, and their successors in interest, who own lands completely surrounded by a wilderness area shall be given such rights as may be necessary to assure adequate access to such lands, or the private or State land shall be exchanged for federally owned land of approximately equal value within the same State under authorities available to the Secretary of the Interior.

(b) Persons with valid mining claims or other valid occupancies wholly within wilderness areas shall be permitted access to such surrounded occupancies by means that are consistent with the preservation of such wilderness and that have been or are being customarily used with respect to other such occupancies surrounded by wilderness. Permits issued under 43 CFR Part 2800 or 2880, or plans approved under 43 CFR Subpart 3809 by the authorized officer shall prescribe the routes of travel to and from the occupancies surrounded by wilderness, the mode of travel, and other conditions reasonably necessary to preserve the wilderness areas.

(c) No roads shall be constructed across wilderness areas unless permitted by the authorized officer. Access by routes or modes of travel not available to the general public may, when fully justified, be permitted by written authorization of the authorized officer. The authorization shall prescribe routes and modes of travel which will result in impacts of least duration and degree on wilderness characteristics and, at the same time, serve the reasonable purposes for which the lands are held or used.

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§ 8560.4-4 Commercial services.

The authorized officer may permit temporary structures and commercial services such as those provided by packers, outfitters and guides within wilderness areas to the extent he/she finds necessary for activities appropriate for realizing the recreational or other wilderness purposes of the area.

§ 8560.4-5 Gathering information about resources.

(a) Any person desiring to conduct any activity for purposes of gathering information about natural resources in wilderness may do so provided it is carried on in a manner compatible with the preservation of the wilderness environment. Where required by other law or regulation, such person shall obtain the necessary permits or authorizations. The authorized officer in granting such permits or authorizations shall allow such activities, subject to such restrictions as he/she may impose to insure that they are carried on in a manner compatible with the preservation of the wilderness environment. This section shall not apply to mineral prospecting under the mining or mineral leasing laws conducted prior to the date when the mining and mineral leasing laws cease to apply to the respective component of the system. (See § 8560.4-6.)

(b) Any person desiring to use motor vehicles, motorized equipment, mechanized transport, or to land aircraft for mineral prospecting or for gathering information about resources, shall notify the Bureau in writing. No form of overland mechanical transport may be used unless approved in accordance with subparts 2920, 3045, 3209 or 3509 of this title. If a permit is required, it shall provide for the protection of public land resources, including wilderness characteristics, protection of the public and restoration of disturbed areas, and may provide for the posting of performance bonds.

§ 8560.4-6 Mining law administration.

The United States mining laws shall apply to each wilderness area under the jurisdiction of the Bureau for the period specified in the Wilderness Act and subsequent establishing legislation to the same extent they were applicable immediately prior to the designation of the area as part of the National Wilderness Preservation System.

(a) No person shall obtain any right or interest in or to any mineral deposits that may be discovered through

prospecting or other information-gathering activity after the date on which the United States mining laws cease to apply to the specific wilderness area.

(b) No mining operations shall be conducted on Bureau-administered wilderness areas without an approved plan of operations where required by subpart 3809 of this chapter.

(c) Holders of valid mining claims established on any Bureau-administered wilderness area before the date such unit was included in the National Wilderness Preservation System shall be accorded the rights provided by the United States mining laws then applicable to the public lands involved.

(d) Any person prospecting or locating a mining claim in a Bureau-administered wilderness area on or after the date the wilderness area was included in the National Wilderness Preservation System, but prior to the date on which the mining laws cease to apply to that area, shall have the rights provided by the United States mining laws, subject to the provisions of the Wilderness Act and subsequent establishing legislation.

(e) All mining claimants shall comply with the reasonable stipulations established by the authorized officer for the protection of resources in accordance with the general purposes of maintaining the National Wilderness Preservation System unimpaired for future use and enjoyment as wilderness and preserving its wilderness character, consistent with the use of the lands for mineral exploration, development, drilling and production, and for transmission lines, water lines, telephone lines or facilities necessary in exploring, drilling, producing, mining and processing operations. Where the use of mechanized transport, aircraft and motorized equipment is essential, these stipulations shall control their use.

(f) As soon as feasible after mining operations cease, but no more than one year thereafter, the operator shall remove all structures, equipment and other facilities and, no more than 6 months thereafter, commence reclamation. Reclamation, including appropriate revegetation, shall be completed within a reasonable time as determined by the authorized officer. Whenever possible and feasible, reclamation shall restore the surface to a contour which appears to be natural, although this may not be the original contour. Where such measures are impractical or impossible, as determined by the authorized officer, reclamation shall provide the maximum achievable

slope stability.

(g) The authorized officer may require the posting of a cash or surety bond or other guarantee in such amount as the authorized officer determines to be sufficient to defray the costs of reclamation.

(h) In the development and operation of mining claims, claimants shall, to extent practicable as determined by the authorized officer and consistent with the use of lands for mineral development, prevent erosion, deterioration of the lands, impairment of their wilderness character, and the obstruction, pollution, or siltation of the streams, lakes and springs.

(i) The owner of patented mining claims located after the lands were included in the National Wilderness Preservation System may cut and use as much of the mature timber as is needed in the extraction, removal and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available. The cutting shall comply with sound principles of forest management as set forth in stipulations issued by the authorized officer.

(j) Prior to approving plans of operations under subpart 3809 of this title, or allowing approved operations to continue, a field reconnaissance of the unpatented mining claim shall be conducted by a Bureau of Land Management minerals examiner to determine whether the claim had a physical exposure of mineralization within its boundaries prior to the withdrawal.

(1) If the authorized officer concludes that such exposure exists and the proposed operations, including surface disturbance, would not prevent the continued preservation of the wilderness character of the area as a whole, the plan shall be reviewed under the normal procedures to ensure prevention of unnecessary and undue degradation of the public lands.

(2) If the authorized officer concludes that such exposure exists and the proposed operation would prevent continued preservation of the wilderness character of the area as a whole, a mineral examination of the subject claim shall be conducted. A proposal to perform only the minimum assessment work per mining claim shall in no case be deemed to prevent the preservation of the wilderness character. If the mineral report concludes that the claim is:

(i) Valid, the plan shall be reviewed under the normal procedures to ensure prevention of unnecessary and undue

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degradation of the public lands; or

(ii) Not valid, the plan of operations shall be denied, or a notice of noncompliance ordering the cessation of operations shall be issued, and contest proceedings shall be initiated to determine the status of the claim definitively.

(3) If the authorized officer concludes that such exposure does not exist, a mineral examination of the subject claim shall be conducted, a mineral examination report prepared, and contest proceedings shall be initiated against the claim, if appropriate.

Neither the adverse conclusions of a mineral examination report, nor the pendency of contest proceedings, shall constitute grounds to disallow a plan of operations to the extent the plan proposes operations that are necessary and due, and are for the purpose of either taking samples and gathering other evidence of claim validity to confirm and corroborate mineral exposures that were physically disclosed and existing on the claim prior to the withdrawal date, or performing the necessary annual assessment work as required by subpart 3851 of this title and 30 U.S.C. 28. The mineral examination requirement of this paragraph shall not cause a suspension of the time limitations governing operating plan approvals contained in § 3809.1-6 of this title. Operations on producing mines shall be allowed to continue pending a final administrative determination of claim validity. After a final administrative decision is rendered by the Department declaring a claim to be null and void, and plans of operations shall be disallowed and all operations shall be discontinued unless and until such decision is reversed or modified as a result of judicial review.

(k) Activities, including prospecting under the United States mining laws, for the purpose of gathering information about minerals in wilderness, shall be allowed, except that any such activity for gathering mineral information after the date on which the United States mining laws cease to apply shall be conducted in a manner compatible with the preservation of the wilderness environment. After such date, mining claims shall not be located in wilderness areas.

§ 8560.4-7 Mineral leases and mineral permits.

(a) No mineral leases shall be issued under the mineral leasing laws in any wilderness area on public lands.

(b) Holders of valid mineral leases established on any Bureau-administered wilderness area before the date such unit was included in the National Wilderness Preservation System shall be accorded the rights granted by the terms and conditions of the specific leases.

(c) Subject to valid existing rights, no person shall obtain any right or interest in or to any mineral deposits that may be discovered in a wilderness area through prospecting or other information-gathering activity after the date on which the laws pertaining to mineral leasing cease to apply to the specific wilderness area.

(d) Permits shall not be issued for the removal of mineral materials commonly known as "common varieties" under the Materials Act of July 31, 1947, as amended and supplemented (30 U.S.C. 601, 604).

§ 8560.4-8 Water and power resources.

Prospecting for water resources and the establishment of new reservoirs, water-conservation works, power projects, transmission lines and other facilities needed in the public interest, and the subsequent maintenance of such facilities, all pursuant to section 4(d)(4)(1) of the Wilderness Act, may be permitted if specifically authorized by the President.

§ 8560.5 Penalties.

(a) Any person who knowingly and willfully violates the regulations in § 8560.1-2 is subject to arrest, conviction and punishment by a fine of not more than \$1,000 or imprisonment for not more than 12 months, or both.

(b) At the request of the Secretary of the Interior, the Attorney General may institute a civil action in any United States district court for an injunction or other appropriate order to prevent any person from utilizing public lands in violation of the regulations of this Part.

[FR Doc. 85-4488 Filed 2-22-85; 8:45 am]

BILLING CODE 4310-84-M

Appendix 1, Part C

Draft Listing of BLM Utah State Office

Comments and Clarifications

INTRODUCTION

Topics below are addressed in the same order as in Appendix 1, Part A, and should be reviewed in conjunction with that narrative. Comments in Part C supplement, but do not replace, those in Part A.

Recreation and Visitor Use

Intensive management of visitors would not be imposed in most Utah BLM wilderness areas due to large acreages and relatively low expected use. However, several wilderness areas (especially those with narrow canyons and high popularity) would receive intensive management of visitor use, by either indirect or direct methods.

Extensive trail systems generally would not be constructed in Utah BLM wilderness areas. In most areas, dry washes, game trails, natural access routes which become trails by repeated use, and open country would provide sufficient access. In some cases, trails could be constructed in carefully selected locations to facilitate access and guide visitors away from environmentally sensitive or hazardous access routes. Small, inobtrusive signs would be installed to mark key access routes, trail heads, and junctions. Detailed maps would be prepared as the primary means of visitor guidance in use of Utah BLM wilderness areas.

Garbage collection and camping facilities (i.e., tables and grills) would not be provided in wilderness areas. A user information program would be developed to implement a "pack-it-out" refuse policy and to encourage proper visitor care of primitive campsites.

Cultural and Historic Resources

The potential need to prevent deterioration (or vandalism) of these resources in Utah wilderness areas would be very high, especially in southeastern Utah. The "minimum tool" policy referred to in Part A is as follows:

"Tools, equipment, or structures may be used for management when they are the minimum necessary for protection of the wilderness resource or when necessary in emergency situations for the health and safety of the visitor. Management will use

the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently.

"For the purpose of the above paragraph, accepted tools, equipment, and structures may include but are not limited to: fire towers, patrol cabins, pit toilets, temporary roads, spraying equipment, hand tools, fire-fighting equipment caches, fencing, and controlled burning. In special or emergency cases involving the health and safety of wilderness visitors, or the protection of wilderness values, aircraft, motorboats, and motorized vehicles may be used."

Forest Resources

No special management actions are expected to involve forest resources in Utah BLM wilderness areas. Generally, cutting would not be involved since, in many areas, tree cover is sparse. Non-commercial harvest of pinyon pine nuts and recreation use of dead-and-down fuelwood would be expected.

Fish and Wildlife

Reintroduction of native species such as desert bighorn sheep could occur in a few Utah wilderness areas. Habitat manipulation generally would not be needed to carry out wilderness management objectives. In rare instances, stream stabilization could be undertaken to promote the perpetuation of endangered species. Predator control in Utah wilderness areas would be considered primarily where livestock grazing allotments were used by domestic sheep.

Fire, Insect, and Disease Management

A user information program would emphasize fire prevention. Fires (natural and human-caused) generally would be treated under a "let-burn" or "limited suppression" approach. Prescribed burning would be used only in rare circumstances, if at all, in Utah BLM wilderness areas.

Control of insects and disease generally would not be expected to occur in Utah BLM wilderness areas.

Water Resource Management

Water-related projects would be very limited in Utah BLM wilderness areas. Construction of new reservoirs using heavy equipment in designated wilderness areas generally would be prohibited.

If water occurs in or runs through a wilderness area, existing water rights (including upstream and downstream) would not be affected by designation. New points of water diversion within wilderness areas would not be allowed unless it would be enhancing to wilderness or authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*.

Based on a November 25, 1985 court decision (*Sierra Club vs. Block*, Civil No. 84-K-2, U.S. District Court, Colorado), unappropriated waters in Colorado wilderness areas, as of the date of wilderness designation, would be reserved to the Federal government for wilderness purposes. By implication, this decision may apply to Utah. It is noted that the Colorado decision is being appealed; therefore, the eventual outcome is uncertain.

Air Quality

The Class II air quality classification applies to Utah BLM wilderness areas.

Range Management

In Utah BLM wilderness areas, livestock use levels generally would remain as now exist, unless adjustments were required due to range condition, based on normal monitoring activities. Vehicle use for range management in wilderness areas generally would require special BLM permission, would be on an infrequent basis, and would be confined to existing ways and jeep trails.

Native (or natural-appearing) materials would be used for construction of all new range facilities unless the costs were unreasonable or the materials would not harmonize with wilderness values. Fence construction could use steel posts if they were earthtone colors (e.g., brown, tan, sage green). In selective locations, cedar posts or split-rail fences could be used. Passages through fences for hikers and/or horseback riders would be required at appropriate locations.

No clearing would be permitted for fence construction, all pipelines would be buried, and all facilities would have to be designed and constructed to blend with the natural landscape. Generally, native materials must be obtained from outside of the wilderness area. Highly visible structures (e.g., overhead powerlines and windmills) would not be permitted. Use of heavy equipment including use of a seed drill and use of bulldozers for chainings or new reservoir construction would not be allowed.

Minerals Management

Comments in Part A pertaining to activities before and after December 31, 1983 would not apply because Utah BLM had no designated wilderness prior to that date. The most pertinent date for Utah BLM areas would be the date of wilderness designation by an Act of Congress. Other significant dates related to minerals are October 21, 1976 (pre-FLPMA/post-FLPMA leases) and December 1982 (WSAs closed to most new leasing).

Access routes and other features associated with plans of operation and mineral management must be designated to: (1) minimize vegetation removal; (2) minimize cut and fill earth work; (3) minimize visual attention; (4) avoid riparian zones and perennial streams; and (5) prevent soil erosion and sedimentation.

If needed, land-based vehicular access would be allowed to valid mining claims, pre-FLPMA leases, and operations on private/State in-holdings. Use of such access generally would not be open to the public.

Administration Structures and Facilities

Utah BLM wilderness areas generally would not involve administrative sites within the boundaries of the designated wilderness. Such sites, if needed, normally would be at a trailhead adjacent to the wilderness area or in a nearby community.

Communication facilities and potential sites could be involved in several of the mountain peak Utah BLM wilderness areas. They would be considered on a case-by-case basis.

Use of Motorized and Mechanical Equipment

Use of motorized equipment in Utah BLM wilderness areas would not be permitted except on a case-by-case basis.

APPENDIX 1, PART C

Utah BLM would not propose any change in current military use of airspace over designated wilderness areas.

Research and Studies

Research sponsored by recognized scientific and educational organizations would be favorably accepted if in keeping with wilderness values.

APPENDIX 1, PART D

Section 603 of THE FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (P.L. 94-579)

Sec. 603. (a) Within fifteen years after the date of approval of this Act, the Secretary shall review those roadless areas of five thousand acres or more and roadless islands of the public lands, identified during the inventory required by section 201(a) of this Act as having wilderness characteristics described in the Wilderness Act of September 3, 1964 (78 Stat. 890; 16 U.S.C. 1131 et seq.) and shall from time to time report to the President his recommendation as to the suitability or unsuitability of each such area or island for preservation as wilderness: *Provided*, That prior to any recommendations for the designation of an area as wilderness the Secretary shall cause mineral surveys to be conducted by the Geological Survey and the Bureau of Mines to determine the mineral values, if any, that may be present in such areas: *Provided further*, That the Secretary shall report to the President by July 1, 1980, his recommendations on those areas which the Secretary has prior to November 1, 1975, formally identified as natural or primitive areas. The review required by this subsection shall be conducted in accordance with the procedures specified in section 3(d) of the Wilderness Act.

(b) The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendations with respect to designation as wilderness of each such area, together with a map thereof and a definition of its boundaries. Such advice by the President shall be given within two years of the receipt of each report from the Secretary. A recommendation of the President for designation as

wilderness shall become effective only if so provided by an Act of Congress.

(c) During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on the date of approval of this Act: *Provided*, That, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection. Unless previously withdrawn from appropriation under the mining laws, such lands shall continue to be subject to such appropriation during the period of review unless withdrawn by the Secretary under the procedures of section 204 of this Act for reasons other than preservation of their wilderness character. Once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area, including mineral surveys required by section 4(d)(2) of the Wilderness Act, and mineral development, access, exchange of lands, and ingress and egress for mining claimants and occupants.

THE WILDERNESS ACT OF SEPTEMBER 3, 1964

Public Law 88-577
88th Congress, S. 4

AN ACT

To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

Section 1. This Act may be cited as the "Wilderness Act".

WILDERNESS SYSTEM ESTABLISHED—
STATEMENT OF POLICY

Section 2.(a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(b) The inclusion of an area in the National Wilderness Preservation System notwithstanding, the area shall continue to be managed by the Department and agency have jurisdiction thereover immediately before its inclusion in the National Wilderness Preservation System unless otherwise provided by Act of Congress. No appropriation shall be available for the payment of expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit nor shall any appropriations be available for additional personnel stated as being required solely for the purpose of managing or administering areas solely because they are included within the National Wilderness Preservation System.

DEFINITION OF WILDERNESS

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude

or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

NATIONAL WILDERNESS PRESERVATION
SYSTEM—EXTENT OF SYSTEM

Section 3.(a) All areas within the national forests classified at least 30 days before the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "wilderness", "wild", or "canoe" are hereby designated as wilderness areas. The Secretary of Agriculture shall—

(1) Within one year after the effective date of this Act, file a map and legal description of each wilderness area with the Interior and Insular Affairs Committees of the United States Senate and the House of Representatives, and such descriptions shall have the same force and effect as if included in this Act: *Provided, however,* That correction of clerical and typographical errors in such legal descriptions and maps may be made.

(2) Maintain, available to the public, records pertaining to said wilderness areas, including maps and legal descriptions; copies of regulations governing them, copies of public notices of, and reports submitted to Congress regarding pending additions, eliminations, or modifications. Maps, legal descriptions, and regulations pertaining to wilderness areas within their respective jurisdictions also shall be available to the public in the offices of regional foresters, national forest supervisors, and forest rangers.

Classification. (b) The Secretary of Agriculture shall, within ten years after the enactment of this Act, review, as to its suitability or unsuitability for preservation as wilderness, each area in the national forests classified on the effective date of this Act by the Secretary of Agriculture or the Chief of the Forest Service as "primitive" and report his findings to the President.

Presidential recommendation to Congress. The President shall advise the United States Senate and House of Representatives of his recommendations with respect to the designation as "wilderness" or other reclassification of each area on which review has been completed, together with maps and a definition of boundaries. Such advice shall be given with respect to not less than one-third of all the areas now classified as "primitive" within three years after the enactment of this Act, not less than two-thirds within seven years after the enactment of this Act, and the remaining areas within ten years after the enactment of this Act.

Congressional approval. Each recommendation of the President for designation as "wilderness" shall become effective only if so provided by an Act of Congress. Areas classified as "primitive" on the effective date of this Act shall continue to be administered under the rules and regulations affecting such areas on the effective date of this Act until Congress has determined otherwise. Any such area may be increased in size by the President at the time he submits his recommendations to the Congress by not more than five thousand acres with no more than one thousand two hundred and eighty acres of such increase in any one compact unit; if it is pro-

APPENDIX 1, PART E

posed to increase the size of any such area by more than five thousand acres or by more than one thousand two hundred and eighty acres in any one compact unit the increase in size shall not become effective until acted upon by Congress. Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value. Notwithstanding any other provisions of this Act, the Secretary of Agriculture may complete his review and delete such areas as may be necessary, but not to exceed seven thousand acres, from the southern tip of the Gore Range-Eagles Nest Primitive Area, Colorado, if the Secretary determines that such action is in the public interest.

Report to President. (c) Within ten years after the effective date of this Act the Secretary of the Interior shall review every roadless area of five thousand contiguous acres or more in the national parks, monuments and other units of the national park system and every such area of, and every roadless island within, the national wildlife refuges and game ranges, under his jurisdiction on the effective date of this Act and shall report to the President his recommendation as to the suitability or unsuitability of each such area or island for preservation as wilderness.

Presidential recommendation to Congress. The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendation with respect to the designation as wilderness of each such area or island on which review has been completed, together with a map thereof and a definition of its boundaries. Such advice shall be given with respect to not less than one-third of the areas and islands to be reviewed under this subsection within three years after enactment of this Act, not less than two-thirds within seven years of enactment of this Act, and the remainder within ten years of enactment of this Act.

Congressional approval. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress. Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the Secretary of the Interior with respect to the maintenance of roadless areas within units of the national park system.

Suitability. (d)(1) The Secretary of Agriculture and the Secretary of the Interior shall, prior to submitting any recommendations to the President with respect to the suitability of any area for preservation as wilderness—

Publication in Federal Register. (A) give such public notice of the proposed action as they deem appropriate, including publication in the Federal Register and in a newspaper having general circulation in the area or areas in the vicinity of the affected land;

Hearings. (B) hold a public hearing or hearings at a location or locations convenient to the area affected. The hearings shall be announced through such means as the respective Secretaries involved deem appropriate, including notices in the Federal Register and in newspapers of general circulation in the area: *Provided*, That if the lands involved are located in more than one State, at least one hearing shall be held in each State in which a portion of the land lies;

(C) at least thirty days before the date of a hearing advise the Governor of each State and the governing board of each county, or in Alaska the borough, in which the lands are located, and Federal departments and agencies concerned, and invite such officials and Federal agencies to submit their views on the proposed action at the hearing or by no later than thirty days following the date of the hearing.

(2) Any views submitted to the appropriate Secretary under

the provisions of (1) of this subsection with respect to any area shall be included with any recommendations to the President and to Congress with respect to such area.

Proposed modification. (e) Any modification or adjustment of boundaries of any wilderness area shall be recommended by the appropriate Secretary after public notice of such proposal and public hearing or hearings as provided in subsection (d) of this section. The proposed modification or adjustment shall then be recommended with map and description thereof to the President. The President shall advise the United States Senate and the House of Representatives of his recommendations with respect to such modification or adjustment and such recommendations shall become effective only in the same manner as provided for in subsections (b) and (c) of this section.

USE OF WILDERNESS AREAS

Section 4. (a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and—

(1) Nothing in this Act shall be deemed to be in interference with the purpose for which national forests are established as set forth in the Act of June 4, 1897 (30 Stat. 11), and the Multiple-Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215).

(2) Nothing in this Act shall modify the restrictions and provisions of the Shipstead-Nolan Act (Public Law 539, Seventy-first Congress, July 10, 1930; 46 Stat. 1020), the Thye-Blatnik Act (Public Law 733, Eightieth Congress, June 22, 1948; 62 Stat. 568), and the Humphrey-Thye-Blatnik-Andresen Act (Public Law 607, Eighty-fourth Congress, June 22, 1956; 70 Stat. 326), as applying to the Superior National Forest or the regulations of the Secretary of Agriculture.

(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq.); section 3 (2) of the Federal Power Act (16 U.S.C. 796 (2)); and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461 et seq.).

(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

PROHIBITION OF CERTAIN USES

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no

landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

SPECIAL PROVISIONS

(d) The following special provisions are hereby made:

(1) Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.

(2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the Geological Survey and the Bureau of Mines to determine the mineral values, if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

Mineral leases, claims, etc. (3) Notwithstanding any other provisions of this Act, until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the same extent as applicable prior to the effective date of this Act, extend to those national forest lands designated by this Act as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, waterlines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and, in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this Act as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction removal and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this Act: *Provided, That, unless hereafter specifically authorized, no patent within wilderness areas designated by this Act shall issue after December 31, 1983, except for the valid claims existing on or before December 31, 1983. Mining claims located after the effective date of this Act within the boundaries of wilderness areas designated by this Act shall create no rights in excess of those rights which may be patented under the provisions of*

this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this Act shall contain such reasonable stipulations as may be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1, 1984, the minerals in lands designated by this Act as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from deposition under all laws pertaining to mineral leasing and all amendments thereto.

Water resources. (4) Within wilderness areas in the national forests designated by this Act, (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and (2) the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

(5) Other provisions of this Act to the contrary notwithstanding, the management of the Boundary Waters Canoe Area, formerly designated as the Superior, Little Indian Sioux, and Caribou Roadless Areas, in the Superior National Forest, Minnesota, shall be in accordance with regulations established by the Secretary of Agriculture in accordance with the general purpose of maintaining, without unnecessary restrictions on other uses, including that of timber, the primitive character of the area, particularly in the vicinity of lakes, streams, and portages: *Provided, That nothing in this Act shall preclude the continuance within the area of any already established use of motorboats.*

(6) Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.

(7) Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(8) Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.

STATE AND PRIVATE LANDS WITHIN WILDERNESS AREAS

Section 5. (a) In any case where State-owned or privately owned land is completely surrounded by national forest lands within areas designated by this Act as wilderness, such State or private owner shall be given such rights as may be necessary to assure adequate access to such State-owned or privately owned land by such State or private owner and their successors in interest, or the State-owned land or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value under authorities available to the Secretary of Agriculture:

Transfers, restriction. *Provided, however, That the United States shall not transfer to a State or private owner any mineral interests unless the State or private owner relinquishes or causes to be relinquished to the United States the mineral interest in the surrounded land.*

APPENDIX 1, PART E

(b) In any case where valid mining claims or other valid occupancies are wholly within a designated national forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

Acquisition. (c) Subject to the appropriation of funds by Congress, the Secretary of Agriculture is authorized to acquire privately owned land within the perimeter of any area designated by this Act as wilderness if (1) the owner concurs in such acquisition or (2) the acquisition is specifically authorized by Congress.

GIFTS, BEQUESTS, AND CONTRIBUTIONS

Section 6. (a) The Secretary of Agriculture may accept gifts or bequests of land within wilderness areas designated by this Act for preservation as wilderness. The Secretary of Agriculture may also accept gifts or bequests of land adjacent to wilderness areas designated by this Act for preservation as

wilderness if he has given sixty days advance notice thereof to the President of the Senate and the Speaker of the House of Representatives. Land accepted by the Secretary of Agriculture under this section shall become part of the wilderness area involved. Regulations with regard to any such land may be in accordance with such agreements, consistent with the policy of this Act, as are made at the time of such gift, or such conditions, consistent with such policy, as may be included in, and accepted with, such bequest.

(b) The Secretary of Agriculture or the Secretary of the Interior is authorized to accept private contributions and gifts to be used to further the purposes of this Act.

ANNUAL REPORTS

Section 7. At the opening of each session of Congress, the Secretaries of Agriculture and Interior shall jointly report to the President for transmission to Congress on the status of the wilderness system, including a list and descriptions of the areas in the system, regulations in effect, and other pertinent information, together with any recommendations they may care to make.

101ST CONGRESS
1ST SESSION

H. R. 1500

To designate certain Federal lands in the State of Utah as wilderness, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MARCH 20, 1989

Mr. OWENS of Utah introduced the following bill; which was referred to the Committee on Interior and Insular Affairs

A BILL

To designate certain Federal lands in the State of Utah as wilderness, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 SECTION 1. SHORT TITLE.

4 This Act may be cited as the "Utah BLM Wilderness
5 Act of 1989".

6 SEC. 2. GENERAL PROVISIONS.

7 (a) NAME.—Each wilderness area named in a table
8 contained in title I shall be—

APPENDIX 2

1 (1) the area referenced in the table, as generally
2 depicted on the map entitled "Utah BLM Wilderness
3 Proposed by H.R. , 101st Congress"; and

4 (2) known by the name given to it in that table.

5 (b) MAP AND DESCRIPTION.—As soon as practicable
6 after enactment of this Act, the Secretary shall file a map
7 and a legal description of each wilderness area designated
8 under this Act with the Committee on Interior and Insular
9 Affairs of the House of Representatives and with the Com-
10 mittee on Energy and Natural Resources of the Senate. Each
11 such map and description shall have the same force and effect
12 as if included in this Act, except that correction of clerical
13 and typographical errors in such legal description and map
14 may be made. Each such map and legal description shall be
15 on file and available for public inspection in the Office of the
16 Director of the Bureau of Land Management, Department of
17 the Interior.

18 (c) SECRETARY.—For the purposes of this Act, the
19 term "Secretary" means the Secretary of the Interior.

20 TITLE I—DESIGNATION OF WILDERNESS

21 SEC. 101. GREAT BASIN WILDERNESS AREAS.

22 (a) FINDINGS.—The Congress finds that the Great
23 Basin region of western Utah is comprised of starkly beauti-
24 ful mountain ranges which rise as islands from the desert
25 floor. Some, like Wah Wah Mountains, are arid and austere,

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1 with massive cliff faces and leathery slopes speckled with
2 pinyon and juniper. Others, like the Deep Creek and Stans-
3 bury Mountains, are high enough to draw moisture from
4 passing clouds and support ecosystems found nowhere else on
5 earth. From bristlecone pine, the world's oldest living thing,
6 to newly flowered mountain meadows, these islands of nature
7 support remarkable biological diversity and provide opportu-
8 nities to experience the colossal silence of the Great Basin.

9 (b) DESIGNATION.—In order to protect and manage so
10 as to preserve the natural conditions of the Great Basin wil-
11 derness areas in western Utah and in furtherance of the pur-
12 poses of the Wilderness Act (16 U.S.C. 1131 et seq.), the
13 following lands in the State of Utah are hereby designated as
14 wilderness and therefore as components of the National
15 Wilderness Preservation System:

Name of Wilderness Area	Approximate Acreage
Cedar Mountains Wilderness.....	55,000
Conger Mountain Wilderness.....	20,400
Deep Creek Mountains Wilderness	76,000
Dugway Mountains Wilderness.....	18,000
Fish Springs Range Wilderness	52,500
Granite Peak Wilderness	9,600
House Range Wilderness.....	125,430
King Top Wilderness.....	84,770
Little Goose Creek Wilderness	1,330
Newfoundland Mountains Wilderness	23,300
Rockwell Wilderness	11,000
Silver Island Mountains Wilderness	20,000
Stansbury Mountains Wilderness	14,590
Wah Wah Mountains Wilderness.....	82,230
White Rock Range Wilderness	2,600

16 SEC. 102. ZION AND MOJAVE DESERT WILDERNESS AREAS.

17 (a) FINDINGS.—The Congress finds that Zion National
18 Park's reknowned landscape of soaring cliff walls, forested

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1 plateaus, and deep narrow gorges extends beyond the bound-
 2 aries of the park onto surrounding public lands managed by
 3 the Secretary through the Bureau of Land Management.
 4 From the pink sand dunes of Moquith Mountain to the golden
 5 pools of Beaver Dam Wash, the Zion and Mojave Desert
 6 wilderness areas encompass three major provinces of the
 7 Southwest: the sculpted canyon country of the Colorado Pla-
 8 teau, the Mojave Desert, and portions of the Great Basin—a
 9 rich mosaic of biological, archeological, and scenic diversity.
 10 One of the last remaining populations of endangered desert
 11 tortoise is found within this wilderness.

12 (b) DESIGNATION.—In order to protect and manage so
 13 as to preserve the natural conditions of the Zion and Mojave
 14 Desert wilderness areas of Utah and in furtherance of the
 15 purposes of the Wilderness Act (16 U.S.C. 1131 et seq.), the
 16 following lands in the State of Utah are hereby designated as
 17 wilderness and therefore as components of the National
 18 Wilderness Preservation System:

Name of Wilderness Area and Unit	Approximate Acreage
Beaver Dam Slopes Wilderness	
Beaver Dam Wash	23,680
Joshua Tree	13,500
Cottonwood Canyon Wilderness.....	11,000
Cougar Canyon Wilderness.....	19,528
Kanab Creek Wilderness	25,750
Moquith Mountain Wilderness	14,830
Red Mountain Wilderness	18,000
Zion Wilderness	
Beartrap Canyon	40
Black Ridge.....	12,500
Canaan Mountain.....	48,000
Deep Creek	7,070
Goose Creek.....	89

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LaVerkin Creek.....	567
North Fork Virgin River.....	1,040
Orderville Canyon.....	1,750
Parunuweap Canyon.....	30,800
Red Butte.....	804
Shunesburg.....	80
Spring Canyon.....	4,433
Taylor Creek Canyon	35
The Watchman.....	600

1 SEC. 103. GRAND STAIRCASE AND KAIPAROWITS PLATEAU

2 WILDERNESS AREAS.

3 (a) GRAND STAIRCASE.—

4 (1) FINDINGS.—The Congress finds that the area
5 known as the Grand Staircase rises more than 6,000
6 feet in a series of great cliffs and plateaus from the
7 depths of the Grand Canyon to the forested rim of
8 Bryce Canyon. It spans six major life zones, from
9 the lower Sonoran Desert to alpine forest, and
10 encompasses geologic formations which display
11 3,000,000,000 years of earth history. Wildlands, man-
12 aged by the Secretary through the Bureau of Land
13 Management, line the intricate canyon system of the
14 Paria River and form a vital wilderness corridor con-
15 nection to the deserts and forests of these national
16 parks.

17 (2) DESIGNATION.—In order to protect and
18 manage so as to preserve the natural conditions of the
19 wilderness area known as the Great Staircase and in
20 furtherance of the purposes of the Wilderness Act (16
21 U.S.C. 1131 et seq.), the following lands in the State

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1 of Utah are hereby designated as wilderness and there-
 2 fore as components of the National Wilderness Preser-
 3 vation System:

Name of Wilderness Area and Unit	Approximate Acreage
Grand Staircase Wilderness:	
Box Canyon	1,900
Cockscomb	10,080
East of Bryce	887
Mud Spring Canyon.....	51,000
Paria-Hackberry.....	158,750
Squaw and Willis Creek	21,000
The Blues-Table Cliff.....	20,000

4 (b) KAIPAROWITS PLATEAU.—

5 (1) FINDINGS.—The Congress finds that east of
 6 the Paria River lies the Kaiparowitz Plateau, one of
 7 the most rugged and isolated wilderness regions in the
 8 United States, a lonely, windswept land of harsh
 9 beauty, distant vistas, and a remarkable variety of
 10 plant and animal species. Ancient forests, abundant big
 11 game animals, and 22 species of raptors thrive undis-
 12 turbed on its grassland mesa tops.

13 (2) DESIGNATION.—In order to protect and
 14 manage so as to preserve the Kaiparowitz Plateau and
 15 in furtherance of the purposes of the Wilderness Act
 16 (16 U.S.C. 1131 et seq.), the following lands in the
 17 State of Utah are hereby designated as wilderness and
 18 therefore as components of the National Wilderness
 19 Preservation System:

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Name of Wilderness Area and Unit	Approximate Acreage
Kaiparowits Wilderness:	
Burning Hills	61,550
Carcass Canyon.....	52,000
Cave Point	5,142
Death Ridge.....	56,000
Fiftymile Bench.....	12,712
Fiftymile Mountain	146,000
Horse Spring Canyon.....	31,500
Warm Creek	30,000
Smoky Hollow	11,600
Wahweap.....	151,420

1 SEC. 104. ESCALANTE CANYONS WILDERNESS AREAS.

2 (a) FINDINGS.—The Congress finds that enchanting
3 glens and coves carved in massive sandstone cliffs, spring-
4 watered hanging gardens, and the silence of ancient Anasazi
5 ruins are exemplary of the unique features that entice hikers,
6 campers, and sightseers from around the world to Escalante
7 Canyon. This wilderness links the spruce fir forests of the
8 11,000 foot Aquarius Plateau with winding slickrock canyons
9 that flow into Lake Powell. It protects critical habitat for
10 deer, elk, and wild bighorn sheep, as well as the scenic integ-
11 rity of one of Utah's most popular natural areas.

12 (b) DESIGNATION.—In order to protect and manage so
13 as to preserve Escalante Canyon wilderness areas and in fur-
14 therance of the purposes of the Wilderness Act (16 U.S.C.
15 1131 et seq.), the following lands in the State of Utah are
16 hereby designated as wilderness and therefore as components
17 of the National Wilderness Preservation System:

Name of Wilderness Area	Approximate Acreage
Colt Mesa/Upper Moody Wilderness.....	24,000
Dance Hall Rock Wilderness.....	640

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Upper Coyote Canyon Wilderness	4,400
Fremont Gorge Wilderness.....	18,000
Lamp Stand Wilderness.....	2,000
Little Egypt Wilderness	13,120
North Escalante Canyons Wilderness	125,000
Phipps-Death Hollow Wilderness	43,000
Scorpion Wilderness	38,380
Steep Creek Wilderness.....	21,900
Studhorse Peaks Wilderness	20,500

1 SEC. 105. HENRY MOUNTAINS WILDERNESS AREAS.

2 (a) FINDINGS.—The Congress finds that the last moun-
3 tain range to be discovered and named by early explorers in
4 the contiguous United States, the Henry Mountains, still re-
5 tains its wild and mysterious character. Fluted badlands
6 adorn the flanks of 11,000 foot Mount Ellen and Mount Pen-
7 nell, containing islands of critical habitat for mule deer and
8 the largest herd of free-roaming buffalo in the Nation. De-
9 spite their relative accessibility, the Henry Mountains remain
10 one of the wildest, least-known ranges in the United States.

11 (b) DESIGNATION.—In order to protect and manage so
12 as to preserve the Henry Mountains and in furtherance of the
13 purposes of the Wilderness Act (16 U.S.C. 1131 et seq.), the
14 following lands in the State of Utah are hereby designated as
15 wilderness and therefore as components of the National Wil-
16 derness Preservation System:

Name of Wilderness Area and Unit	Approximate Acreage
Henry Mountains Wilderness	
Bull Mountain.....	17,870
Bullfrog Creek.....	21,000
Dog Water Creek.....	3,600
Long Canyon.....	14,000
Mount Ellen-Blue Hills.....	128,350
Mount Hillers	18,770
Mount Pennell	143,125

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Notom Bench.....	8,975
Ragged Mountain.....	28,000

1 SEC. 106. DIRTY DEVIL RIVER WILDERNESS AREAS.

2 (a) FINDINGS.—The Congress finds that the Dirty Devil
3 River, once the fortress hideout of outlaw Butch Cassidy's
4 Wild Bunch, has sculpted a maze of slickrock canyons
5 through an imposing landscape of monoliths and inaccessible
6 mesas. This isolated and remote area, long a barrier to civili-
7 zation and would-be colonists, now beckons a different type
8 of explorer, the modern recreationist, who seeks to experi-
9 ence solitude and isolation amid spectacular beauty.

10 (b) DESIGNATION.—In order to protect and manage so
11 as to preserve the Dirty Devil River wilderness areas in
12 southeast Utah and in furtherance of the purposes of the Wil-
13 derness Act (16 U.S.C. 1131 et seq.), the following lands in
14 the State of Utah are hereby designated as wilderness and
15 therefore as components of the National Wilderness Preser-
16 vation System:

Name of Wilderness Area and Unit	Approximate Acreage
Dirty Devil Wilderness	
Dirty Devil-French Springs	169,800
Fiddler Butte	85,000

17 SEC. 107. CEDAR MESA WILDERNESS AREAS.

18 (a) FINDINGS.—The Congress finds that over a thou-
19 sand years ago, the Anasazi Indian culture flourished in the
20 slickrock canyons and on the pinyon-covered mesas of south-
21 eastern Utah. Evidence of their ancient presence pervades

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1 the Cedar Mesa area where haunting cliff dwellings, rock art,
 2 and ceremonial kivas embellish sandstone overhangs and iso-
 3 lated benchlands. This area cries out for protection from the
 4 vandalism and theft of these unique cultural resources. These
 5 wilderness areas are drawn to protect both the Nation's ar-
 6 chaeological heritage and extraordinary wilderness scenic
 7 and ecological values.

8 (b) DESIGNATION.—In order to protect and manage so
 9 as to preserve the Cedar Mesa wilderness areas and in fur-
 10 therance of the purposes of the Wilderness Act (16 U.S.C.
 11 1131 et seq.), the following lands in the State of Utah are
 12 hereby designated as wilderness and therefore as components
 13 of the National Wilderness Preservation System:

Name of Wilderness Area and Unit	Approximate Acreage
White Canyon Wilderness	
Gravel and Long Canyon.....	37,200
Cheesebox Canyon.....	25,000
Harmony Flat.....	10,470
Fortknocker Canyon	7,680
San Juan-Anasazi Wilderness	
Arch Canyon	8,800
Comb Ridge.....	14,460
Fish and Owl Creek.....	65,000
Grand Gulch.....	136,120
Mikes Canyon-Nokai Dome.....	80,000
- Mule Canyon	5,990
- Road Canyon.....	52,000
Squaw and Cross Canyons Wilderness	
Squaw and Papoose Canyons.....	6,580
- Cross Canyon	1,000
Dark Canyon Wilderness	
Dark Canyon	119,300
Sheep Canyon.....	4,500

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1 SEC. 108. CANYONLANDS WILDERNESS AREAS.

2 (a) FINDINGS.—The Congress finds that Arches and
3 Canyonlands National Parks safeguard only a small portion
4 of the extraordinary red-hued, cliff-walled canyonland region
5 of the Colorado Plateau. Canyons with rushing perennial
6 streams, natural arches, bridges, and towers, and the gorges
7 of the Green, Colorado, and Dolores Rivers lie on adjacent
8 wildlands managed by the Secretary through the Bureau of
9 Land Management. Designation of this wilderness achieves a
10 wholeness of protection for this erosional masterpiece of
11 nature and the rich pockets of wildlife found within its ex-
12 panded boundaries.

13 (b) DESIGNATION.—In order to protect and manage so
14 as to preserve the canyonland wilderness areas near Arches
15 and Canyonlands National Parks and in furtherance of the
16 purposes of the Wilderness Act (16 U.S.C. 1131 et seq.), the
17 following lands in the State of Utah are hereby designated as
18 wilderness and therefore as components of the National
19 Wilderness Preservation System:

Name of Wilderness Area and Unit	Approximate Acreage
Canyonlands Basin Wilderness	
Butler Wash	25,780
Goose Neck	10,200
Harts Point	42,000
Indian Creek	26,920
Shafer Canyon	2,800
Shay Mountain	10,000
Six Shooter Peaks	32,640
Labyrinth Wilderness	
Labyrinth Canyon	118,600
Horseshoe Canyon	52,080

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Arches-Lost Spring Wilderness	
Lost Spring Canyon.....	11,600
La Sal Canyons Wilderness	
Beaver Creek	25,500
Fisher Towers	13,300
Granite Creek.....	4,800
Mill Creek	14,570
Negro Bill Canyon.....	13,500
Behind-The-Rocks Wilderness	
Hunter Canyon.....	3,800
Goldbar Canyon.....	8,790
Hatch Wash	13,800
Behind-The-Rocks	20,000
Westwater Wilderness	
Black Ridge.....	5,100
Westwater Canyon	31,160

1 SEC. 109. SAN RAFAEL SWELL WILDERNESS AREAS.

2 (a) FINDINGS.—The Congress finds that the San Rafael
3 Swell towers above the desert like a wilderness castle, ringed
4 by thousand-foot ramparts of Navajo Sandstone. Its high-
5 lands have been fractured by uplift and scooped hollow by
6 erosion over countless millennia, leaving a tremendous basin
7 punctuated by mesas, buttes, and canyons and traversed by
8 sediment-laden desert streams. Among other places, the San
9 Rafael wilderness offers exceptional back country opportuni-
10 ties in the colorful Wild Horse Badlands, the monoliths of
11 North Caineville Mesa, the rock towers of Cliff Wash, and
12 the dark volcanic mountains bordering Capitol Reef National
13 Park. The mountains within this wilderness are among
14 Utah's most productive habitat for Desert Bighorn Sheep.

15 (b) DESIGNATION.—In order to protect and manage so
16 as to preserve the San Rafael Swell wilderness areas and in
17 furtherance of the purposes of the Wilderness Act (16 U.S.C.
18 1131 et seq.), the following lands in the State of Utah are

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- 1 hereby designated as wilderness and therefore as components
- 2 of the National Wilderness Preservation System:

Name of Wilderness Area	Approximate Acreage
Cedar Mountain Wilderness.....	13,700
Devils Canyon Wilderness.....	20,000
Hondu Country Wilderness.....	20,500
Jones Bench Wilderness.....	2,900
Limestone Cliffs Wilderness.....	21,300
Mexican Mountain Wilderness	65,000
Muddy Creek Wilderness.....	240,315
Mussentuchit Badlands Wilderness.....	22,400
Red Desert Wilderness.....	32,800
San Rafael Reef Wilderness	80,000
Sids Mountain Wilderness.....	90,000
Upper Muddy Creek Wilderness	16,600
Wild Horse Mesa Wilderness.....	48,700

3 SEC. 110. BOOK CLIFFS AND UINTA BASIN WILDERNESS

4 AREAS.

5 (a) FINDINGS.—The Congress finds that the Book Cliffs
6 and Uinta Basin wilderness areas offer a unique quality of
7 wilderness big game hunting opportunities in verdant high-
8 plateau forests, multi-day float trips down the Green River in
9 Desolation Canyon, and opportunity for calm water canoe
10 weekends on the White River. The long rampart of the Book
11 Cliffs bounds the area on the south, while seldom-visited up-
12 lands, dissected by the rivers and streams, slope away to the
13 north into the Uinta Basin. Bighorn sheep, elk, mule deer,
14 bear, and cougar all flourish in the back country of the Book
15 Cliffs.

16 (b) DESIGNATION.—In order to protect and manage so
17 as to preserve the Book Cliffs area and in furtherance of the
18 purposes of the Wilderness Act (16 U.S.C. 1131 et seq.), the

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- 1 following lands in the State of Utah are hereby designated as
2 wilderness and therefore as components of the National
3 Wilderness Preservation System:

Name of Wilderness Area and Unit	Approximate Acreage
Desolation Canyon Wilderness	
Coal Canyon.....	61,000
Desolation Canyon.....	362,000
Flume Canyon.....	50,000
Nutters Hole	62,000
Spruce Canyon	20,350
Turtle Canyon	33,800
White River Wilderness.....	12,000
Greater Dinosaur Wilderness	
Bull Canyon	520
Diamond Breaks	7,000
Daniels Canyon	5,000
Moonshine Draw.....	4,800
West Cold Springs.....	4,500

4 TITLE II—ADMINISTRATIVE PROVISIONS

5 SEC. 201. ADMINISTRATION.

6 Subject to valid existing rights, the wilderness areas
7 designated under this Act shall be administered by the Secre-
8 tary in accordance with section 603 of the Federal Land
9 Policy and Management Act of 1976 (43 U.S.C. 1782) and
10 the provisions of the Wilderness Act governing areas desig-
11 nated by that Act as wilderness.

○

101ST CONGRESS
1ST SESSION

H. R. 1501

To designate certain public lands in the State of Utah as wilderness, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MARCH 20, 1989

Mr. HANSEN introduced the following bill; which was referred jointly to the Committees on Interior and Insular Affairs and Agriculture

A BILL

To designate certain public lands in the State of Utah as wilderness, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "Utah Public Lands Wil-
5 derness Act of 1989".

6 **SEC. 2. DESIGNATION AND ADMINISTRATION.**

7 (a) DESIGNATION.—In furtherance of the purposes of
8 the Wilderness Act (16 U.S.C. 1131 et seq.), the following
9 lands in the State of Utah, which comprise approximately
10 1,405,625 acres, are hereby designated as wilderness and

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1 therefore as components of the National Wilderness Preser-
 2 vation System:

Map reference number	Name of wilderness area	Approximate acres
3	Deep Creek Mountains	50,984
9	Notch Peak	28,000
11	Wah Wah Mountains	36,382
19	Parunuweap Canyon	7,400
20	Canaan Mountain	32,800
24	Paria-Hackberry	59,270
29	Phipps-Death Hollow	39,256
30	Steep Creek	18,350
31	North Escalante Canyons/the Gulch	54,500
33	Scorpion	9,620
35	Fifty Mile Mountain	51,540
36	Mt. Ellen-Blue Hills	58,480
38	Dirty Devil	61,000
44	Little Rockies	38,700
46	Grand Gulch Complex	105,520
47	Road Canyon	45,720
48	Fish Creek Canyon	35,220
51	Dark Canyon	68,030
52	Butler Wash	24,190
58	Horseshoe Canyon (North)	20,500
59	San Rafael Reef	59,170
60	Crack Canyon	25,335
61	Muddy Creek	31,400
63	Sids Mountain	78,408
64	Mexican Mountain	46,750
66	Desolation Canyon	242,000
67	Turtle Canyon	27,960
68	Floy Canyon	23,140
72	Westwater Canyon	26,000
Grand total		1,405,625

3 Each wilderness area named in the preceding table shall
 4 be—

5 (1) the area referenced in the table, as generally
 6 depicted on the map entitled "Pocket Map 4 — Para-
 7 mount Wilderness Quality Alternative" which accom-
 8 panies the Utah BLM Statewide Wilderness Environ-
 9 mental Impact Statement, dated January 1986; and

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1 (2) known by the name given to it in the table.

2 (b) ADMINISTRATION.—Subject to valid existing rights,
3 the wilderness areas designated under this section shall be
4 administered by the Secretary of the Interior (hereinafter in
5 this Act referred to as the “Secretary”) in accordance with
6 section 603 of the Federal Land Policy and Management Act
7 of 1976 (43 U.S.C. 1782) and the provisions of the Wilder-
8 ness Act governing areas designated by that Act as wilder-
9 ness, except that any part of any such wilderness area which
10 is subject to a grazing lease on the date of enactment of this
11 Act shall be open to grazing in accordance with regulations
12 promulgated by the Secretary.

13 (c) MAP AND DESCRIPTION.—As soon as practicable
14 after enactment of this Act, the Secretary shall file a map
15 and a legal description of each wilderness area designated
16 under this section with the Committee on Interior and Insu-
17 lar Affairs of the House of Representatives and with the
18 Committee on Energy and Natural Resources of the Senate.
19 Each such map and description shall have the same force and
20 effect as if included in this Act, except that correction of
21 clerical and typographical errors in such legal description and
22 map may be made. Each such map and legal description shall
23 be on file and available for public inspection in the Office of
24 the Director of the Bureau of Land Management, Depart-
25 ment of the Interior.

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1 (d) BUFFER ZONES NOT INTENDED.—The Congress
2 does not intend that designation by this section of wilderness
3 areas in the State of Utah lead to the creation of protective
4 perimeters or buffer zones around each wilderness area. The
5 fact that nonwilderness activities or uses can be seen or
6 heard from areas within a wilderness shall not, of itself, pre-
7 clude such activities or uses up to the boundary of the wilder-
8 ness area.

9 (e) ADMINISTRATION OF WILDERNESS STUDY AREAS
10 NOT DESIGNATED AS WILDERNESS.—Areas in the State of
11 Utah administered by the Secretary of the Interior, acting
12 through the Bureau of Land Management which, upon enact-
13 ment of this Act, are not designated as wilderness shall be
14 managed for multiple use in accordance with the Federal
15 Land Policy and Management Act of 1976 (43 U.S.C. 1701
16 et seq.).



APPENDIX 3

LIST OF LAND IN-HOLDINGS

The acreage figures reported and analyzed for each Wilderness Study Area (WSA) in this Environmental Impact Statement (EIS) are BLM land totals. In addition to the BLM lands, there are State and/or private land in-holdings in 54 of the 82 WSAs, as shown in Appendix Table 3.1. State land comprises between 5 and 9.6 percent in 30 of these WSAs.

As explained in Chapter 1, the State may request an exchange on a case-by-case basis. This could be done using BLM's normal exchange program as authorized by the Federal Land Policy and Management Act (FLPMA) or the realty provisions of the 1964 Wilderness Act. The State believes that the request could best be carried out by application of the "roughly equivalent value" concept which emanated from the *Andrus vs. Utah* case and which was applied in the State Indemnity Selection Program.

State sections and acreages listed in Appendix Table 3.2 are based on existing map and file information that would be verified by a formal title search prior to actual transfer. This title search could result in slight revisions to the list.

Assuming that the State requested an exchange acceptable to all concerned, the actual lands and acreages exchanged would be based on wilderness designation decisions by Congress, and the size of the designated wilderness areas would be increased by the acreage of State in-held land acquired as Federal land in the exchange. Acreages of State land in-holdings associated with each statewide alternative are given separately in Chapter 3 of this volume.

If exchanged, the current Federal land acquired by the State in the exchange would be selected by the State, subject to review and approval by BLM. These lands would be within the same vicinity and of the same general character and value as the State sections within each WSA. Both surface and subsurface estates would be transferred. Leases, permits, and any other granted rights on both transferred State and Federal lands would be honored by the receiving agency and would remain in effect until normal expiration or for an appropriate term (possibly 10 to 15 years), after which such rights would be adjusted by negotiations to conform to normal standards of the receiving agency.

Table 3.1
Surface Ownership of In-held Lands

Map Reference Number or Letter	WSA Name	Percent Ownership of Total Unit			Total Unit Acreage
		BLM	State	Private	
1	North Stansbury Mountains	100.00	0.00	0.00	10,480.00
2	Cedar Mountains	93.93	0.00	6.07	53,764.00
3	Deep Creek Mountains	95.22	4.43	0.35	73,373.80
4	Fish Springs	93.05	6.81	0.14	56,420.80
5	Rockwell	100.00	0.00	0.00	9,150.00
6	Swasey Mountain	94.15	5.85	0.00	52,577.72
7	Howell Peak	90.65	9.35	0.00	27,359.28
8	Conger Mountain	94.10	5.90	0.00	21,680.00
9	Notch Peak	91.95	8.05	0.00	55,608.88
10	King Top	92.72	7.28	0.00	71,430.68
11	Wah Wah Mountains	92.94	7.06	0.00	45,341.84
12	Cougar Canyon	100.00	0.00	0.00	15,968.00
13	Red Mountain	95.88	3.91	0.21	19,035.12
14	Cottonwood Canyon	100.00	0.00	0.00	11,330.00
15	LaVerkin Creek Canyon	100.00	0.00	0.00	567.00
16	Deep Creek	100.00	0.00	0.00	3,320.00
17	North Fork Virgin River	100.00	0.00	0.00	1,040.00
18	Orderville Canyon	100.00	0.00	0.00	1,750.00

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.1 (continued)
Surface Ownership of In-held Lands

Map Reference Number or Letter	WSA Name	Percent Ownership of Total Unit			Total Unit Acreage
		BLM	State	Private	
19	Parunuweap Canyon	96.09	3.91	0.00	32,053.24
20	Canaan Mountain	93.56	6.44	0.00	50,418.50
21	Moquith Mountain	95.61	4.13	0.26	15,510.42
22	The Blues	96.75	3.25	0.00	19,670.00
23	Mud Spring Canyon	94.07	5.93	0.00	40,476.52
24	Paria-Hackberry	93.76	6.21	0.03	145,281.12
25	The Cockscomb	100.00	0.00	0.00	10,080.00
26	Wahweap	93.84	7.16	0.00	144,760.84
27	Burning Hills	94.13	5.87	0.00	65,389.72
28	Death Ridge	94.24	5.76	0.00	66,711.24
29	Phipps-Death Hollow	94.35	5.65	0.00	45,290.04
30	Steep Creek	91.99	8.01	0.00	23,803.20
31	North Escalante Canyons/The Gulch	94.02	5.98	0.00	127,374.51
32	Scorpion	96.56	3.44	0.00	37,164.00
34	Escalante Canyons Tract 5	100.00	0.00	0.00	760.00
35	Fifty Mile Mountain	92.21	7.79	0.00	158,484.40
36	Mt. Ellen-Blue Hills	93.22	6.78	0.00	87,670.92
37	Bull Mountain	100.00	0.00	0.00	11,800.00
38	Dirty Devil	95.98	4.02	0.00	63,554.80
39	Horseshoe Canyon (South)	95.28	4.72	0.00	40,722.24
40	French Spring-Happy Canyon	97.50	2.50	0.00	25,639.72
41	Fiddler Butte	95.01	4.99	0.00	76,938.08
42	Mt. Pennell	92.93	7.07	0.00	79,956.52
43	Mt. Hillers	100.00	0.00	0.00	20,000.00
44	Little Rockies	96.80	3.20	0.00	39,980.00
45	Mancos Mesa	91.99	8.01	0.00	55,921.04
46	Grand Gulch ISA Complex	97.78	2.22	0.00	107,920.00
47	Road Canyon	96.47	3.53	0.00	54,340.00
48	Fish Creek Canyon	93.53	6.47	0.00	49,650.40
49	Mule Canyon	100.00	0.00	0.00	5,990.00
50	Cheesebox Canyon	100.00	0.00	0.00	15,410.00
51	Dark Canyon ISA Complex	100.00	0.00	0.00	68,030.00
52	Butler Wash	92.65	7.35	0.00	26,110.00
53	Bridger Jack Mesa	100.00	0.00	0.00	5,290.00
54	Indian Creek	100.00	0.00	0.00	6,870.00
55	Behind The Rocks	95.18	4.82	0.00	13,275.00
56	Mill Creek Canyon	100.00	0.00	0.00	9,780.00
57	Negro Bill Canyon	100.00	0.00	0.00	7,620.00
58	Horseshoe Canyon (North)	96.43	3.57	0.00	21,260.00
59	San Rafael Reef	93.62	6.38	0.00	63,199.36
60	Crack Canyon	97.54	2.46	0.00	25,975.00
61	Muddy Creek	98.00	2.00	0.00	32,040.00
62	Sids Mountain	94.15	5.85	0.00	86,001.16
64	Mexican Mountain	95.81	4.19	0.00	62,207.80
65	Jack Canyon	91.69	7.82	0.49	8,180.00
66	Desolation Canyon	92.48	7.48	0.04	314,482.38
67	Turtle Canyon	94.59	5.41	0.00	35,618.64
68	Floy Canyon	93.96	5.83	0.21	77,273.61
69	Coal Canyon	95.17	4.83	0.00	64,546.36
70	Spruce Canyon	96.95	3.05	0.00	20,990.00
71	Flume Canyon	93.02	6.98	0.00	54,611.80
72	Westwater Canyon	96.53	3.47	0.00	32,280.00
73	WinterRidge	94.31	5.69	0.00	45,023.44
A	Red Butte	100.00	0.00	0.00	304.00

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.1 (continued)
Surface Ownership of In-held Lands

Map Reference Number or Letter	WSA Name	Percent Ownership of Total Unit			Total Unit Acreage
		BLM	State	Private	
B	Spring Creek Canyon	100.00	0.00	0.00	4,433.00
C	The Watchman	100.00	0.00	0.00	600.00
D	Taylor Creek Canyon	100.00	0.00	0.00	35.00
E	Goose Creek Canyon	100.00	0.00	0.00	89.00
F	Beartrap Canyon	100.00	0.00	0.00	40.00
G	Fremont Gorge	100.00	0.00	0.00	2,540.00
H	Lost Spring Canyon	100.00	0.00	0.00	3,880.00
I	Daniels Canyon	100.00	0.00	0.00	2,496.00
J	South Needles	100.00	0.00	0.00	160.00

Source: WSA Analyses.

Table 3.2
State Land In-Holdings

Map Number	WSA	Township	Range	Section	Subsection	Acres
2	Cedar Mountains	2S	10W	2		643.00 ^a
		3S	10W	2		636.88 ^a
		3S	10W	32		640.00 ^a
		4S	10W	2		663.84 ^a
		4S	10W	16		640.00 ^a
		4S	10W	17	SESE	40.00 ^a
					Total	3,263.72
3	Deep Creek Mountains	9S	18W	16		640.00
		9S	18W	32		640.00
		10S	18W	2		647.80
		10S	18W	16		640.00
		11S	18W	32		640.00
					Total	3,207.80
4	Fish Springs	11S	14W	32		640.00
		12S	14W	16		640.00
		12S	14W	32		640.00
		13S	14W	2		640.08
		13S	14W	16		640.00
		13S	14W	32		640.00
					Total	3,840.08
6	Swasey Mountain	15S	13W	16		640.00
		15S	13W	32		640.00
		15.5S	13W	32		517.72
		16S	13W	15		640.00
		17S	12W	16		640.00
					Total	3,077.72

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
7	Howell Peak	17S	13W	16		640.00
		17S	13W	32		640.00
		17S	14W	36		640.00
		18S	14W	2		<u>639.28</u>
					Total	2,559.28
8	Conger Mountain	17S	16W	32		640.00
		18S	17W	2		<u>640.00</u>
					Total	1,280.00
9	Notch Peak	18S	13W	16		640.00
		19S	13W	32		640.00
		19S	14W	16		640.00
		19S	14W	36		640.00
		20S	13W	2		636.88
		20S	13W	16		640.00
		20S	14W	2		<u>6442.00</u>
					Total	4,478.88
10	King Top	20S	14W	32		640.00
		20S	15W	16		640.00
		20S	15W	32		640.00
		20S	15W	36		640.00
		20S	16W	32		640.00
		21S	15W	2		454.52
		21S	15W	16		640.00
		21S	15W	32		640.00
		21S	15W	36		640.00
		22S	15W	2		446.16
		22S	15W	36		<u>640.00</u>
					Total	6,660.68
11	Wah Wah Mountains	23S	16W	36		640.00
		24S	16W	2		641.84
		24S	16W	36		640.00
		25S	15W	32		640.00
		26S	15W	16		<u>640.00</u>
					Total	3,201.84
13	Red Mountain	41S	17W	2		745.12
19	Parunuweap	42S	8W	16		640.00
		42S	9W	2		<u>613.24</u>
					Total	1,253.24
20	Canaan Mountain	42S	10W	32		640.00
		42S	10W	36		640.00
		42S	11W	36		640.00 ^a
		43S	9.5W	32		221.70
		43S	10W	16		640.00
		43S	10W	36		466.80
		43S	11W	2		<u>640.00</u>
					Total	3,888.5

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
21	Moquith Mountain	43S	7W	32		640.00
		44S	7W	3	Lot 4	40.42 ^a
					Total	680.42
22	The Blues	36S	1W	32		640.00
23	Mud Spring Canyon	37S	1W	16		640.00
		37S	1W	36		640.00
		37S	1E	32		640.00
		38S	1E	2		481.52
					Total	2,401.52
24	Paria-Hackberry	38S	2W	32		640.00
		38S	3W	36		640.00
		39S	1W	16		640.00
		39S	1W	32		640.00
		39S	2W	16		640.00
		39S	2W	32		640.00
		39S	2W	36		640.00
		40S	1W	2		636.36
		40S	1W	16	E2, N2NW4	400.00 ^a
		40S	1W	32		640.00
		40S	2W	2		653.60
		40S	2W	36		640.00
		40S	3W	2		648.36
		41S	2W	2		690.64
		41S	2W	16		630.16
				Total		9,419.12
25	The Cockscomb	42S	1W	16		200.00 ^a
		42S	1W	32		326.70 ^a
		43S	1W	2		220.40 ^a
				Total		747.10
26	Wahweap	39S	1E	36		640.00
		39S	2E	32		640.00
		40S	1W	36		640.00
		40S	1E	2		638.12
		40S	1E	32		640.00
		40S	1E	36		640.00
		40S	2E	36		640.00
		40S	3E	16		640.00
		41S	1W	2		683.68
		41S	1E	16		640.00
		41S	1E	36		640.00
		41S	2E	2		691.12
		41S	2E	16		640.00
		41S	2E	32		640.00
		42S	1E	2		667.92
		42S	2E	16		640.00
				Total		10,360.84

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
27	Burning Hills	39S	4E	16		640.00
		39S	4E	36		640.00
		40S	4E	2		639.72
		40S	4E	36		640.00
		41S	4E	36		640.00
		41S	5E	16		640.00
					Total	3,839.72
28	Death Ridge	36S	2E	36		345.00 ^a
		37S	2E	2		451.96 ^a
		37S	2E	16		640.00
		37S	2E	32		640.00
		38S	2E	36		640.00
		39S	2E	2		641.08
		39S	3E	2		640.16
		39S	3E	16		640.00
					Total	4,637.48
29	Phipps-Death Hollow	34S	3E	36		638.08
		34S	4E	32		640.00
		35S	3E	2		640.00
		35S	4E	2		640.00
					Total	2,559.04
30	Steep Creek	33S	5E	36		640.00
		33S	6E	16		640.00
		34S	5E	2		627.20
		35S	4E	12		160.00 ^a
					Total	2,067.20
31	North Escalante Canyons/ The Gulch	34S	5E	16		452.00 ^a
		34S	5E	32		640.00
		34S	5E	36		640.00
		35S	5E	2		584.76
		35S	5E	16		640.00
		35S	5E	36		640.00
		35S	6E	2		639.79
		35S	6E	16		640.00
		35S	6E	32		640.00
		35S	6E	36		640.00
		36S	4E	2		641.48
		36S	5E	2		636.48
		36S	6E	32		640.00
					Total	8,074.51
32	Carcass Canyon	36S	3E	32		640.00 ^a
		37S	3E	36		640.00
		37S	4E	32		640.00
					Total	1,920.00
33	Scorpion	38S	7E	16		640.00
		38S	7E	32		640.00
					Total	1,280.00

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
35	Fifty Mile Mountain	38S	4E	36		640.00
		38S	5E	16		640.00
		38S	5E	32		640.00
		38S	5E	36		640.00
		39S	5E	2		640.44
		39S	5E	16		640.00
		39S	5E	36		640.00
		39S	6E	16		640.00
		39S	6E	32		640.00
		39S	6E	36		640.00
		40S	5E	36		640.00
		40S	6E	2		641.00 ^a
		40S	6E	16		640.00
		40S	6E	32		640.00
		40S	6E	36		640.00
		40S	7E	16		640.00 ^a
		40S	7E	32		640.00
		40S	7E	36		640.00 ^a
		41S	5E	2		729.00
		41S	6E	2		731.96
		41S	6E	16		640.00
		41S	7E	2		737.76 ^a
		41S	7E	16		640.00
Total						14,360.16
36	Mt. Ellen-Blue Hills	29S	9E	16		640.00
		29S	9E	32		640.00
		30S	9E	16		640.00
		30S	10E	32		640.00
		30S	10E	36		726.80
		31S	10E	2		872.12
		28S	9E	32		640.00
		29S	8E	36		640.00
		30S	8E	2		506.00
Total						5,944.92
38	Dirty Devil	29S	13E	16		640.00
		29S	13E	36		640.00
		29S	14E	32		638.96
		29S	13E	2		635.84
Total						2,554.80
39	Horseshoe Canyon (South)	28S	15E	2		641.96
		28S	15E	36		640.00
		29S	15E	2		640.28
Total						1,922.24
40	French Spring-Happy Canyon	30S	15E	2		639.72

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (Continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
41	Fiddler Butte	31S	14E	36		640.00
		31S	15E	32		640.00
		32S	13E	16		640.00
		32S	15E	2		638.08
		32S	15E	16		640.00
		32S	15E	32		640.00
					Total	3,838.08
42	Mt. Pennell	33S	10E	2		637.20
		33S	10E	16		640.00
		33S	8E	36		640.00
		33S	9E	16		640.00
		33S	9E	32		640.00
		34S	9E	2		540.08
		34S	9E	16		640.00
		34S	9E	36		640.00
		35S	9E	2		639.24
					Total	5,656.52
44	Little Rockies	33S	13E	32		640.00
		35S	12E	16		640.00
					Total	1,280.00
45	Mancos Mesa	36S	14E	32		640.00
		37S	13E	2		640.00
		37S	13E	16		640.00
		37S	13E	32		640.00
		37S	13E	36		640.00
		37S	14E	16		640.00
		38S	13E	2		641.04
					Total	4,481.04
46	Grand Gulch	38S	17E	16	N2S2	480.00
		39S	16E	36		640.00
		39S	17E	32		640.00
		40S	17E	16		640.00
					Total	2,400.00
47	Road Canyon	39S	18E	36		640.00
		39S	19E	36		640.00
		39S	20E	32		640.00
					Total	1,920.00
48	Fish Creek Canyon	38S	19E	2		651.00
		38S	19E	36		640.00
		38S	20E	32		640.00
		39S	19E	2		639.40
		39S	20E	16		640.00
					Total	3,210.40
52	Butler Wassh	31S	18E	36		640.00
		31S	18E	32		640.00
		32S	19E	16		640.00
					Total	1,920.00

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
55	Behind The Rocks	26S	22E	32		640.00
58	Horseshoe Canyon (North)	25S	16E	36		640.00
		25S	17E	32	NENE,SWNW,NW	<u>120.00</u>
					Total	760.00
59	San Rafael Reef	23S	12E	2		639.92
		23S	12E	36		640.00
		23S	13E	16		640.00
		23S	13E	32		639.00
		24S	12E	2		830.44
		24S	12E	32		<u>640.00</u>
					Total	4,029.36
60	Crack Canyon	25S	11E	16		640.00
61	Muddy Creek	25S	9E	32		640.00
63	Sids Mountain	20S	10E	32		640.00
		20S	10E	36	W2	320.00
		21S	9E	36		640.00
		21S	10E	2		871.44
		21S	10E	16		640.00
		21S	10E	32		640.00
		22S	9E	2		639.72
		22S	10E	16		<u>640.00</u>
					Total	5,031.16
64	Mexican Mountain	20S	12E	36		640.00
		20S	13E	16		640.00
		20S	13E	32		640.00
		20.5S	13E	32		320.68
		20.5S	13E	36	1-4,SW4,SE4	<u>367.12</u>
					Total	2,607.80
65	Jack Canyon	13S	16E	16		640.00
		13S	16E	17	SW,NE	<u>40.00^a</u>
					Total	680.00

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
66	Desolation Canyon	13S	16E	36		640.00
		13S	17E	16	N2	320.00 ^a
		14S	16E	2	S2NW,S2,3,4	473.27
		14S	16E	32		640.00
		14S	16E	36		640.00
		15S	16E	2		659.00
		15S	16E	16		640.00
		15S	16E	36		640.00
		16S	15E	2		638.38
		16S	16E	2		619.44
		16S	16E	16		640.00
		16S	16E	36		640.00
		16S	17E	16	W2	320.00
		16S	17E	32		640.00
		17S	15E	32		640.00
		17S	16E	2		639.00
		18S	15E	16		640.00
		18S	15E	32		640.00
		18S	15E	36		640.00
		18S	16E	31	SW NE Lot 3	77.68 ^a
		18S	16E	32		640.00
		18S	16E	36	W2 W2	160.00
		18S	17E	32	NE,S2S2,NESE	400.00
		18S	17E	36		640.00
		18S	18E	16	1-4	55.87
		18S	18E	32		538.28
		18S	18E	36		640.00
		18S	19E	32		640.00
		19S	15E	2		776.84
		19S	15E	16		640.00
		19S	15E	36		640.00
		19S	16E	2		454.16
		19S	16E	16		640.00
		19S	16E	32		640.00
		19S	17E	2		785.36
		19S	17E	16		640.00
		19S	18E	32		640.00
		19S	18E	36		640.00
		19S	18E	2		783.48
		19S	19E	16		640.00
		19S	19E	32	1-4	201.28
		20S	15E	2		655.32
		20S	16E	3	12	35.15 ^a
					Total	23,519.68
67	Turtle Canyon	16S	15E	16		640.00
		16S	15E	36		640.00
		17S	15E	2		648.64
					Total	1,928.64

APPENDIX 3: LIST OF LAND IN-HOLDINGS

Table 3.2 (continued)

Map Number	WSA	Township	Range	Section	Subsection	Acres
68	Floy Canyon	19S	19E	32		640.37
		19S	19E	36		636.32
		19S	20E	32		640.00
		20S	19E	32	Lots 104	86.08
		20S	19E	2		551.76
		20S	19E	16		640.00
		20S	20E	16		640.00
		20.5S	18E	32		674.08
					Total	4,508.61
69	Coal Canyon	19S	20E	36		640.00
		19S	21E	16		640.00
		19S	22E	16		640.00
		19S	22E	32		640.00
		20S	20E	2		556.36
					Total	3,116.36
70	Spruce Canyon	18S	21E	36		640.00
71	Flume Canyon	17S	22E	32		640.00
		17S	22E	36		640.00
		17S	23E	32		640.00
		18S	22E	2		647.64
		19S	23E	16		640.00
		19S	23E	32		604.16
					Total	3,811.80
72	Westwater Canyon	20S	25E	36		640.00
		21S	25E	16	E2,SW	480.00
					Total	1,120.00
73	Winter Ridge	13S	21E	36		640.00
		14S	21E	2		641.44
		14S	22E	32		640.00
		15S	22E	16		640.00
					Total	2,561.44
					Total Surface and Subsurface	183,248.00
					Total Subsurface Only	10,271.79
					Grand Total	193,519.79

Source: BLM File Data.

*Subsurface ownership only.

THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

On December 28, 1973, the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) became law and superseded similar acts passed in 1966 and 1969. The purpose of the Act, as amended, is to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of endangered and threatened species, and to achieve the conservation purposes of various treaties and conventions (Ninety-Third Congress of the U.S., 1973). The ESA was the first Federal legislation to include a comprehensive effort to conserve plant and animal species. The Act represents a significant departure from traditional States' rights for regulating the take of native species of wildlife. The provisions of the ESA apply to plant and animal species that have been listed as endangered or threatened by the Secretary of the Interior and those proposed for listing as threatened or endangered. The responsibility for carrying out the ESA was assigned to the Federal Government.

Compliance with Section 7 of the ESA requires active management on the part of BLM to ensure the conservation of species in danger of extinction, as well as a review (screening) program to ensure that authorized actions do not threaten the existence of a species or adversely modify its critical habitat. Section 7 is that portion of the Act under which consultation with FWS occurs. The Act provides civil and criminal penalties for violations of its provisions and permits citizens to sue to require compliance with the Act, making it one of the most stringent statutes affecting BLM. The official Federal listing of species as endangered or threatened creates a nondiscretionary, legally binding obligation on the part of BLM to use all its authorities to prevent the extinction of threatened or endangered species.

POLICY STATEMENT

BLM policy regarding special status species is detailed in BLM Manual 6840. Special status species are defined in the manual as listed threatened or endangered species, species proposed for listing as threatened or endangered, Category 1 and Category 2 candidate species (50 CFR Part 17), and other sensitive species (species that could easily become endangered or extinct in a State which are not currently listed either as threatened or endangered or as candidate species by FWS).

In summary, the manual directs that BLM shall conserve threatened and endangered species and the ecosystems upon which they depend and use existing authority in furtherance of the purposes of the Endangered Species Act. Specific actions include determination of the occurrence and distribution of all threatened and endangered species on BLM-administered lands, an identification of essential habitat, and designation of critical habitat and prescription of management for the conservation of these habitats in land use plans. BLM will develop and implement management plans that will ensure the conservation of threatened and endangered species and their habitat. BLM will ensure that activities affecting populations and habitats of threatened and endangered species are designed to be consistent with recovery needs and objectives. BLM must ensure that all actions authorized or funded by BLM are in compliance with the Endangered Species Act. Specific compliance items include formal consultation with FWS, when necessary, participation on recovery teams, review drafts of recovery plans, and retain in Federal ownership all habitat essential for the survival or recovery of any threatened or endangered species.

BLM policy for species that are proposed for listing as threatened or endangered is essentially the same as for species that are currently listed as endangered or threatened. BLM will ensure that all actions authorized or carried out do not cause any irreversible or irretrievable commitment of resources or reduce the future management options for the species involved.

Regarding Category 1 and 2 species, BLM will carry out management consistent with the principles of multiple use for the conservation of candidate species and their habitats and ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species. BLM will request technical assistance from FWS and any other qualified source on any planned action that may contribute to the need to list a candidate species.

Sensitive species will receive the protection provided by the policy for candidate species. State laws protecting State-listed species apply to all BLM programs and actions to the extent that they are consistent with FLPMA and other Federal laws. The State Director will develop policies that will assist the State in

APPENDIX 4: THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

achieving their management objectives for these species.

SPECIAL STATUS SPECIES IN WSAs

Several species status species are known to, or are thought to, occur in several of the WSAs. Those that have been listed as threatened or endangered by FWS are discussed in the text in the Vegetation and Wildlife Including Special Status Species sections. The WSAs in which they may occur are also identified. Category 1 and 2 candidate plant species are listed in Table 4.1 of this appendix. Sensitive plant species that are known to occur in WSAs are listed in Table 4.2.

As part of the Draft EIS process, BLM requested a list of candidate, proposed, and listed threatened and endangered species from FWS. The enclosed memorandum from FWS dated October 16, 1985, resulted. As work began on the Final EIS, BLM again contacted FWS and asked that this memorandum be reviewed and updated. FWS responded with the enclosed memorandum dated September 16, 1987, which revised and updated their previous memorandum. Inventory

work by BLM personnel resulted in additional information to that provided by the FWS lists in certain of the WSAs resulted in slight modifications of the FWS lists. This information is included in the text of the individual WSA analyses where they occur.

In February of 1990, the FWS published a revised listing of potential candidate plant species in the Federal Register. Category 1 and 2 plant species in Utah increased from 103 to 122. Some of the 19 additional candidate species are known to occur within certain of the WSAs. However, due to the lateness of this publication, BLM was not able to reflect these changes in the Final EIS. They are, however, expected to be minor. The status of listed threatened and endangered plant species in WSAs discussed in the Final EIS is current as of May 1990.

The policy of the FWS relative to formal Section 7 consultation is generally protective of endangered and threatened species and in and of itself will not require formal consultation. Formal Section 7 consultation will be done on a project-by-project basis as proposals and applications for actions inside WSAs are reviewed by BLM (USDI, FWS, 1990).

Table 4.1
Known or Potential Occurrence of Category 1 and 2 Candidate Plant Species in WSAs

Common Name	Scientific Name	WSA
Deep Creek Mtn. stickweed	<u>Hackelia ibapaensis</u>	Deep Creek Mountains
Giant Fourwing saltbush	<u>Atriplex canescens</u> var. <u>gigantea</u>	Rockwell
Compact catseye	<u>Cryptantha compacta</u>	Howell Peak, Conger Mountain, Notch Peak, King Top, Wah Wah Mountains
Sand-loving wild-buckwheat	<u>Eriogonum ammophilum</u>	Notch Peak, King Top, Wah Wah Mountains
Jones globemallow	<u>Sphaeralcea caespitosa</u>	Wah Wah Mountains
No common name	<u>Asplenium andrewsii</u>	LaVerkin Creek Canyon, Deep Creek, North Fork Virgin River, Orderville Canyon, Parunuweap Canyon, Canaan Mountain, Red Butte, Spring Creek Canyon, The Watchman, Taylor Creek Canyon, Goose Creek Canyon, Beartrap Canyon
Zion daisy	<u>Erigeron sionis</u>	LaVerkin Creek Canyon, Deep Creek, North Fork Virgin River, Orderville Canyon, Parunuweap Canyon, Canaan Mountain, Red Butte, Spring Creek Canyon, The Watchman, Taylor Creek Canyon, Goose Creek Canyon, Beartrap Canyon

APPENDIX 4: THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

Table 4.1 (Continued)
Known or Potential Occurrence of Category 1 and 2 Candidate Plant Species in WSAs

Common Name	Scientific Name	WSA
Zion tansy	<u>Sphaceromeria ruthiae</u>	LaVerkin Creek Canyon, Deep Creek, North Fork Virgin River, Orderville Canyon, Parunuweap Canyon, Canaan Mountain, Red Butte, Spring Creek Canyon, The Watchman, Taylor Creek Canyon, Goose Creek Canyon, Beartrap Canyon
Jones golden-aster	<u>Heterotheca jonesii</u>	LaVerkin Creek Canyon, Deep Creek, North Fork Virgin River, Orderville Canyon, Parunuweap Canyon, Canaan Mountain, The Blues, Mud Spring Canyon, Burning Hills, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain, Red Butte, Spring Creek Canyon, The Watchman, Taylor Creek Canyon, Goose Creek Canyon, Beartrap Canyon
Gumbo milk-vetch	<u>Astragalus ampullaris</u>	Moquith Mountain, The Cockscomb
Stella's pepper-grass	<u>Lepidium montanum</u> var. <u>stellae</u>	The Blues, Mud Spring Canyon, Burning Hills, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain
Neese pepper-grass	<u>Lepidium montanum</u> var. <u>neeseae</u>	The Blues, Mud Spring Canyon, Burning Hills, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/ The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain
No common name	<u>Coryphantha missouriensis</u> var. <u>marstonii</u>	The Blues, Mud Spring Canyon, Burning Hills, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain
Paria scurf-pea	<u>Psoralea pariensis</u>	The Blues, Mud Spring Canyon, Paria-Hackberry, The Cockscomb, Wahweap, Burning Hills, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons/ Tract 5, Fifty Mile Mountain
No common name	<u>Psoralea epipsila</u>	Paria-Hackberry, The Cockscomb, Wahweap
Sand-loving beardstongue	<u>Penstemon ammophilum</u>	Paria-Hackberry, The Cockscomb, Wahweap
Tumulosa bladderpod	<u>Lesquerella tumulosa</u>	Paria-Hackberry, The Cockscomb, Wahweap
Cronquist aster	<u>Xylorhiza cronquistii</u>	Paria-Hackberry, The Cockscomb, Wahweap, Death Ridge, Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain

APPENDIX 4: THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

Table 4.1 (Continued)
Known or Potential Occurrence of Category 1 and 2 Candidate Plant Species in WSAs

Common Name	Scientific Name	WSA
Higgins biscuitroot	<u>Cymopterus higginsii</u>	Wahweap, Burning Hills
Atwood's beardstongue	<u>Penstemon atwoodii</u>	Burning Hills
No common name	<u>Spiranthes diluvialis</u>	Phipps-Death Hollow, Steep Creek, North Escalante Canyons/The Gulch, Carcass Canyon, Scorpion, Escalante Canyons Tract 5, Fifty Mile Mountain, Mt. Ellen-Blue Hills, Fiddler Butte, Mt. Pennell, Mt. Hillers, Little Rockies, Fremont Gorge
Red Canyon catchfly	<u>Silene petersonii</u> var. <u>minor</u>	North Escalante Canyons/The Gulch
Winkler cactus	<u>Pediocactus winkleri</u>	Mt. Ellen-Blue Hills, Fiddler Butte, Mt. Pennell, Mt. Hillers, Little Rockies
Cronquist wild-buckwheat	<u>Eriogonum cronquistii</u>	Mt. Ellen-Blue Hills, Fiddler Butte, Mt. Pennell, Mt. Hillers, Little Rockies
Harrison milk-vetch	<u>Astragalus harrisonii</u>	Mt. Pennell, Mt. Hillers, Little Rockies
Hole-in-the-rock prairie clover	<u>Dalea epica</u>	Little Rockies
Rabbit valley gilia	<u>Gilia caespitosa</u>	Fremont Gorge
Kachina daisy	<u>Erigeron kachinensis</u>	Mancos Mesa, Grand Gulch, Road Canyon, Fish Creek Canyon, Mule Canyon, Cheesebox Canyon, Dark Canyon, Butler Wash, South Needles
Cronquist milk-vetch	<u>Astragalus cronquistii</u>	Road Canyon
Cutler milkweed	<u>Asclepias cutleri</u>	Behind the Rocks, Lost Spring Canyon
Entrada skeletonplant	<u>Lygodesmia entrada</u>	Behind the Rocks, Mill Creek Canyon, Negro Bill Canyon, Lost Spring Canyon, Horseshoe Canyon (South)
Cisco milk-vetch	<u>Astragalus sabulosus</u>	Lost Spring Canyon
Latilobum biscuitroot	<u>Lomatium latilobum</u>	Lost Spring Canyon
Barneby skeleton-mustard	<u>Schoenocrambe barnebyi</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
Jones Psorothamnus	<u>Psorothamnus polyadenius</u> var. <u>jonesii</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain, Desolation Canyon, Turtle Canyon
No common name	<u>Hymenoxys depressa</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon Sids Mountain, Mexican Mountain
San Rafael Golbe-mallow	<u>Sphaeralcea psoraloides</u>	San Rafael Reef, Crack Canyon, Muddy Creek, Devils Canyon, Sids Mountain, Mexican Mountain
No common name	<u>Physaria acutifolia</u> var. <u>purpurea</u>	Desolation Canyon, Floy Canyon, Coal Canyon, Spruce Canyon, Flume Canyon

APPENDIX 4: THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

Table 4.1 (Continued)
Known or Potential Occurrence of Category 1 and 2 Candidate Plant Species in WSAs

Common Name	Scientific Name	WSA
Yellow blanketflower	<u>Gaillardia flava</u>	Desolation Canyon, Turtle Canyon
Graham's penstemon	<u>Penstemon grahamii</u>	Desolation Canyon, Winter Ridge
Canyon sweetvetch	<u>Hedysarium occidentale</u> var. <u>canone</u>	Desolation Canyon, Turtle Canyon,

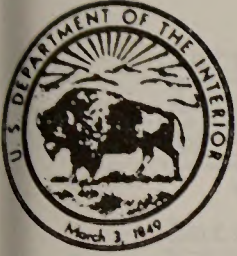
Table 4.2
Known or Potential Occurrence of Sensitive Plant Species in BLM WSAs¹

Common Name	Scientific Name	Wilderness Study Area
Kass rockcress	<u>Draba kassii</u>	Deep Creek Mountains
Henrville woodyaster	<u>Xylorhiza confertifolia</u>	The Blues
Barneby milk-vetch	<u>Astragalus barnebyi</u>	North Escalante Canyons/The Gulch
Cottom milk-vetch	<u>Astragalus cottomii</u>	Grand Gulch, Fish Creek Canyon, Mule Canyon
Monument milk-veetch	<u>Astragalus monumentalis</u>	Grand Gulch, Fish Creek Canyon, Cheesebox Canyon, Dark Canyon, Butler Wash, Indian Creek
Alcove death camas	<u>Zigadenus vaginatus</u>	Grand Gulch, Fish Creek Canyon, Cheesebox Canyon, Behind the Rocks, Lost Spring Canyon
Comb Wash buckwheat	<u>Eriogonum clavellatum</u>	Road Canyon
Isely milk-vetch	<u>Astragalus iselyi</u>	Behind the Rocks
Tall cryptanth	<u>Cryptantha elata</u>	Westwater Canyon
Shale columbine	<u>Aquilegia barnebyi</u>	Winter Ridge
Barneby catseye	<u>Cryptantha barnebyi</u>	Winter Ridge
White River penstemon	<u>Penstemon albifluvis</u>	Winter Ridge
Evening primrose	<u>Oenothera acutissima</u>	Daniels Canyon

Source: Individual WSA Analyses.

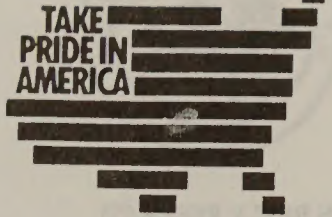
¹ These are plant species that have not been listed as threatened or endangered by FWS or are candidates for listing. They are sensitive, rare, or endemic species that are of concern to BLM and deserve special management consideration.

APPENDIX 4



United States Department of the Interior

Fish and Wildlife Service
Fish and Wildlife Enhancement
2060 Administration Building
1745 West 1700 South
Salt Lake City, Utah 84104-5110



IN REPLY REFER TO:

(FWE)
Mail Stop 65411

September 16, 1987

MEMORANDUM

TO: State Director, Utah State Office, Bureau of Land Management,
Salt Lake City, Utah

FROM: State Supervisor, Fish and Wildlife Enhancement, U.S. Fish and
Wildlife Service, Salt Lake City, Utah

SUBJECT: Threatened, Endangered and Candidate Species in Utah Wilderness
Study Areas.

This memorandum is an amendment to our list of listed and proposed threatened and endangered species and candidate species which may occur within Utah Wilderness Study Areas dated October 16, 1985. We are providing you with this updated version in response to your memorandum of August 5, 1987. There are no changes in the 1985 list as it pertains to federally listed and proposed threatened and endangered species. There are significant changes in candidate species which are listed below (see 49 FR 21664, 50 FR 37958 and 50 FR 39526).

<u>Common name</u>	<u>Scientific name</u>	<u>WSA Map Ref. # in which species may occur</u>
Great Basin Silverspot butterfly	<u>Speyeria nokomis nokomis</u>	13 through 73 and A through H
Tanner's Black camel cricket	<u>Utaenetes tanneri</u>	36 through 40 and 58 through 64
Mount Ellen chipmunk	<u>Eutamias umbrinus sedulus</u>	36, 37, 42, 43
Southwestern otter	<u>Lutra canadensis sonora</u>	55, 58, 66, 72
Virgin River montane vole	<u>Microtus montanus rivularis</u>	13 through 20 and A through F
Bonneville pocket gopher	<u>Thomomys umbrinus bonnevilliei</u>	4
Mount Ellen pocket gopher	<u>Thomomys umbrinus dissimilis</u>	36, 37, 42, 43
Salt Gulch pocket gopher	<u>Thomomys umbrinus powelli</u>	29, 30, 31
Skull Valley pocket gopher	<u>Thomomys umbrinus robustus</u>	1, 2
Swasey Spring pocket gopher	<u>Thomomys umbrinus sevieri</u>	6, 8
Harrison milkvetch	<u>Astragalus harrisonii</u>	42
Compact catseye	<u>Cryptantha compacta</u>	6 through 11
No common name	<u>Lygodesmia entrada</u>	55 through 58 and H
No common name	<u>Physaria acutifolia</u> var. <u>purpurea</u>	66 and 68 through 71
Jones Globe-mallow	<u>Sphaeralcea caespitosa</u>	11
No common name	<u>Spiranthes diluvialis</u>	29, 30, 31, 36 and G
<u>Astragalus iselyi</u> - delete 3c		
<u>Cryptantha elata</u> - delete 3c		

If you have any questions or if we can be of further assistance please contact Larry England of this office, FTS 588-4430.

Robert A. Ruesink

APPENDIX 4



IN REPLY REFER TO

United States Department of the Interior

FISH AND WILDLIFE SERVICE

ENDANGERED SPECIES OFFICE

2078 ADMINISTRATION BLDG.

1745 WEST 1700 SOUTH

SALT LAKE CITY, UTAH 84104

October 16, 1985

MEMORANDUM

TO: State Director, Utah State Office, Bureau of Land Management
Salt Lake City, Utah

FROM: Field Supervisor, Endangered Species Office, U.S. Fish and Wildlife
Service, Salt Lake City, Utah

SUBJECT: Threatened, Endangered, and Candidate Species in Utah Wilderness
Study Areas

The Fish and Wildlife Service (FWS) has reviewed your memorandum of May 11, 1982 and letter of March 28, 1985, and map of June 17, 1985, requesting informal consultation under Section 7 of the Endangered Species Act. We have revised our letter of July 29, 1985, as a consequence of meetings between Ferris Clegg and Greg Thayne of your office and Larry England of our office. The following listed and proposed threatened (T) and endangered (E) species may occur in or near one or more of the wilderness study areas.

Black-footed ferret (E)	<u>Mustela nigripes</u>
Peregrine falcon (E)	<u>Falco peregrinus</u>
Bald eagle (E)	<u>Haliaeetus leucocephalus</u>
Colorado squawfish (E)	<u>Ptychocheilus lucius</u>
Bonytail chub (E)	<u>Gila elegans</u>
Humpback chub (E)	<u>Gila cypha</u>
Desert Tortoise (T)	<u>Gopherus agassizii</u>
Purple-spined hedgehog cactus (E)	<u>Echinocereus engelmannii</u> var. <u>purpureus</u>
Wright fishhook cactus (E)	<u>Sclerocactus wrightiae</u>
Uinta Basin hookless cactus (T)	<u>Sclerocactus glaucus</u>
Last Chance townsendia (T)	<u>Townsendia aprica</u>
Jones cycladenia (E)	<u>Cycladenia humilis</u> var. <u>jonesii</u>
Welsh's milkweed (E)	<u>Asclepias welshii</u>
Spineless hedgehog cactus (E)	<u>Echinocereus triglochidiatus</u> var. <u>inermis</u>
Maguire daisy (E)	<u>Erigeron maguirei</u> var. <u>maguirei</u>

In addition to the above mentioned threatened and endangered species the following species are currently under review by the FWS for possible listing in the future (see 50 CFR 17.11 & 17.12 and 45 FR 82480, 48 FR 53640, 50 FR 19761, 49 FR 21664, 47 FR 58454 and appendix to this letter).

<u>Asclepias cutleri</u>	Cutler milkweed
<u>Asplenium andrewsii</u>	N.C.N.
<u>Astragalus ampullarius</u>	Gumbo milkvetch
<u>Astragalus cronquistii</u>	Cronquist milkvetch

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<u>Astragalus iselyi</u>	Isely milkvetch
<u>Astragalus sabulosus</u>	Pavement milkvetch
<u>Atriplex canescens</u>	N.C.N.
var. <u>gigantea</u>	
<u>Buteo regalis</u>	Ferruginous hawk
<u>Buteo swainsoni</u>	Swainson's hawk
<u>Charadrius alexandrinus nivosus</u>	Western snowy plover
<u>Charadrius montanus</u>	Mountain plover
<u>Coccyus americanus occidentalis</u>	Western yellow-billed cuckoo
<u>Cicindela limbata albissima</u>	Coral Pink Sand Dunes tiger beetle
<u>Coryphantha missouriensis</u>	N.C.N.
var. <u>marstonii</u>	
<u>Cryptantha elata</u>	Cliffdweller's candlestick
<u>Cymopterus higginsii</u>	Higgins biscuitroot
<u>Dipodomys merriami frenatus</u>	Merriam's kangaroo rat
<u>Erigeron kachinensi</u>	Kachina daisy
<u>Erigeron sionis</u>	Zion daisy
<u>Eriogonum ammophilum</u>	Sand-loving wild-buckwheat
<u>Eriogonum cronquistii</u>	Cronquist wild-buckwheat
<u>Eriogonum smithii</u>	Smith wild-buckwheat
<u>Euderma maculatum</u>	Spotted bat
<u>Gailardia flava</u>	Yellow blanketflower
<u>Gilia caespitosa</u>	Rabbit valley gilia
<u>Gopherus agassizii</u>	Desert tortoise
<u>Hackelia ibapensis</u>	Deep Creek Mtn. stickseed
<u>Hedysarum occidentale</u>	Canyon sweetvetch
var. <u>canone</u>	
<u>Heloderma suspectum</u>	Gila monster
<u>Heterotheca jonesii</u>	Jones golden-aster
<u>Hymenoxys depressa</u>	N.C.N.
<u>Lepidium montanum</u> var. <u>neeseae</u>	Neese pepper-grass
<u>Lepidium montanum</u> var. <u>stellae</u>	Stella's pepper-grass
<u>Lesquerella tumulosa</u>	bladderpod
<u>Lomatium latilobum</u>	Latilobum biscuitroot
<u>Numenius americanus</u>	Long-billed curlew
<u>Oenothera acutissima</u>	N.C.N.
<u>Pediocactus despainii</u>	San Rafael cactus
<u>Pediocactus winkleri</u>	Oyster shell cactus
<u>Penstemon ammophilum</u>	Sand-loving beardtongue
<u>Penstemon atwoodii</u>	Atwood's beardtongue
<u>Penstemon concinnus</u>	Tunnel Springs beardtongue
<u>Penstemon grahamii</u>	Graham's beardtongue
<u>Plegadis chihi</u>	White-faced ibis
<u>Psoralea epipsila</u>	N.C.N.
<u>Psoralea pariensis</u>	Paria scurf-pea
<u>Psorathamnus polyadenius</u>	N.C.N.
var. <u>jonesii</u>	

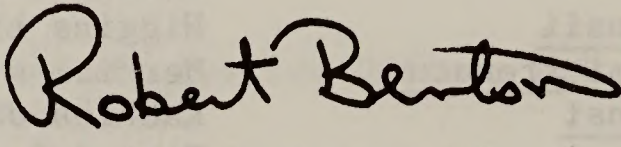
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Salmo clarki utah
Schoenocrambe barnebyi
Sphaeralcea psoraloides
Sphaeromeria ruthiae
Strix occidentalis lucida
Vireo bellii arizonae
Xylorhiza cronquistii
Xyrauchen texanus

Bonneville cutthroat trout
Barneby thelypody
San Rafael globe-mallow
Zion tansy
Southern spotted owl
Arizona Bell's vireo
Cronquist aster
Razor back sucker

N.C.N. = No Common Name

The FWS representative who will provide you with technical assistance is
Larry England (FTS 588-4430).


for Robert G. Ruesink

Enclosure

APPENDIX 4

Threatened, Endangered and Candidate Species

Which May Occur in Utah BLM Wilderness Study Areas

<u>MAP REF. #*</u>	<u>WSA ID Number/Name</u>	<u>Species</u>
1	020-089/North Stansbury Mountains	Long-billed curlew (C) Ferruginous hawk Spotted bat (C) Swainson's hawk (C) Western snowy plover (C) Western yellow-billed cuckoo (C) White-faced ibis (C)
2	020-094/Cedar Mountain	see Map Ref. # 1
3	020-060/Deep Creek 050-020 Mountains	Bonneville cutthroat trout (C) <u>Hackelia ibapensis</u> (C) Ferruginous hawk (C) Long-billed curlew (C) Swainson's hawk (C) Western snowy plover (C) White-faced ibis (C)
4	050-127/Fish Springs	Ferruginous hawk (C) Long-billed curlew (C) Swainson's hawk (C) Western snowy plover (C) White-faced ibis (C)
5	050-186/Rockwell	<u>Atriplex canescens</u> var. <u>gigantea</u> (C) Ferruginous hawk (C) Long-billed curlew (C) Swainson's hawk (C) Western snowy plover (C) White-faced ibis (C)
6	050-061/Swasey Mountains	see Map Ref. # 4
7	050-077/Howell Peak	see Map Ref. # 4

* numbers based on the introduction to "Utah Statewide Wilderness Environmental Impact Statement"

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|----|--------------------------------------|---|
| 8 | 050-035/Conger Mountain | see Map Ref. # 4 |
| 9 | 050-076/Notch Peak | see Map Ref. # 4 |
| 10 | 050-070/King Top | <u>Eriogonum ammophilum</u> (C)
Ferruginous hawk (C)
Long-billed curlew (C)
Swainson's hawk (C)
Western snowy plover (C)
White-faced ibis (C) |
| 11 | 050-073/Wah Wah
040-205 Mountains | see Map Ref. # 10 |
| 12 | 040-123/Cougar Canyon | Arizona Bell's vireo (C)
Ferruginous hawk (C)
Long-billed curlew (C)
Merriam's kangaroo rat (C)
Mountain plover (C)
Southern spotted owl (C)
Swainson's hawk (C)
Western snowy plover (C)
Western yellow-billed cuckoo (C)
White-faced ibis (C) |
| 13 | 040-132/Red Mountain | <u>Echinocereus engelmannii</u>
var. <u>purpureus</u> (E)
Arizona Bell's vireo (C)
Desert tortoise (C)
Ferruginous hawk (C)
Gila monster (C)
Long-billed curlew (C)
Merriam's kangaroo rat (C)
Mountain plover (C)
Southern spotted owl (C)
Swainson's hawk (C)
Western snowy plover (C)
Western yellow-billed cuckoo (C) |
| 14 | 040-046/Cottonwood Canyon | see Map Ref. # 13 |

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|----|------------------------------------|--|
| 15 | 040-153/LaVerkin Creek
Canyon | <p>Peregrine falcon (E)</p> <p><u>Asplenium andrewsii</u> (C)</p> <p><u>Erigeron sionis</u> (C)</p> <p><u>Heterotheca jonesii</u> (C)</p> <p><u>Sphaeromeria ruthiae</u> (C)</p> <p>Arizona Bell's vireo (C)</p> <p>Ferruginous hawk (C)</p> <p>Long-billed curlew (C)</p> <p>Merriam's kangaroo rat (C)</p> <p>Mountain plover (C)</p> <p>Southern spotted owl (C)</p> <p>Swainson's hawk (C)</p> <p>Western snowy plover (C)</p> <p>Western yellow-billed cuckoo (C)</p> <p>White-faced ibis (C)</p> |
| 16 | 040-146/Deep Creek | see Map Ref. # 15 |
| 17 | 040-150/North Fork
Virgin River | see Map Ref. # 15 |
| 18 | 040-145/Orderville
Canyon | see Map Ref. # 15 |
| 19 | 040-230/Parunuweap
Canyon | see Map Ref. # 15 |
| 20 | 040-143/Canaan
Mountain | see Map Ref. # 15 |
| 21 | 040-217/Moquith
Mountain | <p><u>Asclepias welshii</u> (E)</p> <p>Coral Pink Sand Dunes Tiger Beetle (C)</p> <p>Peregrine falcon (E)</p> <p>Arizona Bell's vireo (C)</p> <p>Ferruginous hawk (C)</p> <p>Long-billed curlew (C)</p> <p>Southern spotted owl (C)</p> <p>Swainson's hawk (C)</p> <p>Western snowy plover (C)</p> <p>Western yellow-billed cuckoo (C)</p> <p>White-faced ibis (C)</p> |

APPENDIX 4

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|----|--------------------------------------|---|
| 22 | 040-268/The Blues | <p>Peregrine falcon (E)</p> <p><u>Heterotheca jonesii</u> (C)</p> <p><u>Coryphantha missouriensis</u> var. <u>marstonii</u> (C)</p> <p>Ferruginous hawk (C)</p> <p>Long-billed curlew (C)</p> <p><u>Lepidium montanum</u> var. <u>neeseae</u> (C)</p> <p><u>Psoralea pariensis</u> (C)</p> <p>Southern spotted owl (C)</p> <p><u>Lepidium montanum</u> var. <u>stellae</u> (C)</p> <p>Swainson's hawk (C)</p> <p>White-faced ibis (C)</p> |
| 23 | 040-077/Mud Springs Canyon | see Map Ref. # 22 |
| 24 | 040-247/Paria-Hackberry | <p>Peregrine falcon (E)</p> <p>Arizona Bell's vireo (C)</p> <p><u>Psoralea epipsila</u> (C)</p> <p>Ferruginous hawk (C)</p> <p>Long-billed curlew (C)</p> <p><u>Psoralea pariensis</u> (C)</p> <p><u>Penstemon ammophilum</u> (C)</p> <p>Southern spotted owl (C)</p> <p>Swainson's hawk (C)</p> <p><u>Lesquerella tumulosa</u> (C)</p> <p>Western snowy plover (C)</p> <p>White-faced ibis (C)</p> <p><u>Xylorhiza cronquistii</u> (C)</p> |
| 25 | 040-275/The Cockscomb | see Map Ref. # 24 |
| 26 | 040-248/Wah Weap | see Map Ref. # 24 |
| 27 | 040-079/Burning Hills | see Map Ref. # 22 |
| 28 | 040-078/Death Ridge | see Map Ref. # 22 |
| 29 | ISA-Phipps-Death Hollow | see Map Ref. # 22 |
| 30 | 040-061/Steep Creek | see Map Ref. # 22 |
| 31 | ISA-North Escalante Canyon/The Gulch | see Map Ref. # 22 |

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|----|--|--|
| 32 | 040-076/Carcass Canyon | see Map Ref. # 22 |
| 33 | 040-082/Scorpion | see Map Ref. # 22 |
| 34 | ISA-Escalante Canyon
/Tract 5 | see Map Ref. # 22 |
| 35 | 040-080/Fifty Mile
Mountain | see Map Ref. # 22 |
| 36 | 050-238/Mt. Ellen-
Blue Hills | <u>Sclerocactus wrightiae</u> (E)
<u>Eriogonum cronquistii</u> (C)
<u>Pediocactus winkleri</u> (C)
Peregrine falcon (E)
Ferruginous hawk (C)
White-faced ibis (C) |
| 37 | 050-242/Bull Mountain | see Map Ref. # 36 |
| 38 | 050-236A/Dirty Devil | Black-footed ferret (E)
Ferruginous hawk (C)
White-faced ibis (C) |
| 39 | 050-237/Horseshoe
Canyon (South) | see Map Ref. # 38 |
| 40 | 050-236B/French Spring
Happy Canyon | see Map Ref. # 38 |
| 41 | 050-241/Fiddler Butte | see Map Ref. # 36 |
| 42 | 050-248/Mt. Pennell | see Map Ref. # 36 |
| 43 | 050-249/Mt. Hillers | see Map Ref. # 36 |
| 44 | 050-247/Little Rockies | see Map Ref. # 36 |

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45	060-181/Mancos Mesa	Peregrine falcon (E) Ferruginous hawk (C) Long-billed curlew (C) Southern spotted owl (C) Western yellow-billed cuckoo (C) White-faced ibis (C) <u>Erigeron kachinensi</u> (C)
46	Grand Gulch/ISA Complex	see Map Ref. # 45
47	060-201/Road Canyon	see Map Ref. # 45
48	060-204/Fish Creek Canyon	see Map Ref. # 45
49	060-205B/Mule Canyon	see Map Ref. # 45
50	060-191/Cheesebox Canyon	see Map Ref. # 45
51	Dark Canyon/ ISA Complex	see Map Ref. # 45
52	060-169/Butler Wash	see Map Ref. # 45
53	060-167/Bridger Jack Mesa	<u>Echinocereus triglochidiatus</u> var. <u>inermis</u> (E) Peregrine falcon (E) Ferruginous hawk (C) Long-billed curlew (C) Southern spotted owl (C) Western yellow-billed cuckoo (C) White-faced ibis (C)
54	060-164/Indian Creek	Peregrine falcon (E) Ferruginous hawk (C) Long-billed curlew (C) Southern spotted owl (C) Western yellow-billed cuckoo (C)

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|----|--|---|
| 55 | 060-140A/Behind
the Rocks | Black-footed ferret (E)
<u>Cycladenia humilis</u> var.
<u>jonesii</u> (P)
Ferruginous hawk (C)
Long-billed curlew (C)
Southern spotted owl (C)
Western yellow-billed cuckoo (C) |
| 56 | 060-139A/Mill Creek
Canyon | see Map Ref. # 55 |
| 57 | 060-138/Negro Bill
Canyon | see Map Ref. # 55 |
| 58 | 060-045/Horseshoe
Canyon
(North) | Colorado squawfish (E)
Humpback chub (E)
Bonytail chub (E)
Black-footed ferret (E)
Ferruginous hawk (C)
Razorback sucker (C)
White-faced ibis (C) |
| 59 | 060-029A/San Rafael
Reef | Black-footed ferret (E)
<u>Sclerocactus wrightiae</u> (E)
<u>Erigeron maguirei</u> var.
<u>maguirei</u> (P)
<u>Townsendia aprica</u> (PE)
<u>Cycladenia humilis</u> var.
<u>jonesii</u> (PE)
<u>Hymenoxys depressa</u> (C)
<u>Pediocactus despainii</u> (C)
White-faced ibis (C)
Southern spotted owl (C)
Swainson's hawk (C)
Western yellow-billed cuckoo (C)
Ferruginous hawk (C)
<u>Sphaeralcea psoraloides</u> (C)
<u>Schoenocrambe barnebyi</u> (C)
<u>Psoralea polyadenius</u> var.
<u>jonesii</u> (C)
Western snowy plover (C) |
| 60 | 060-028A/Crack Canyon | see Map Ref. # 59 |
| 61 | 060-007/Muddy Creek | see Map Ref. # 59 |

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- 62 060-025/Devils Canyon see Map Ref. # 59
- 63 060-023/Sid's Mountain see Map Ref. # 59
- 64 060-054/Mexican Mountain see Map Ref. # 59
- 65 060-068C/Jack Canyon Bald eagle (E)
 Ferruginous hawk (C)
 Western snowy plover (C)
 White-faced ibis (C)
 Long-billed curlew (C)
 Southern spotted owl (C)
 Western yellow-billed cuckoo (C)
- 66 060-068A/Desolation Canyon Bald eagle (E)
 Black-footed ferret (E)
 Peregrine falcon (E)
 Colorado squawfish (E)
 Humpback chub (E)
 Bonytail chub (E)
Sclerocactus glaucus (T)
Gailardia flava (C)
Penstemon grahamii (C)
Psorathamnus polyadenius var. jonesii (C)
Hedysarum occidentale var. canone (C)
 Ferruginous hawk (C)
 Western snowy plover (C)
 White-faced ibis (C)
 Long-billed curlew (C)
 Razorback sucker (C)
 Southern spotted owl (C)
 Western yellow-billed cuckoo (C)
- 67 060-067/Turtle Canyon Hedysarum occidentale var. canone (C)
Gailardia flava (C)
Psorathamnus polyadenius var. jonesii (C)
 Ferruginous hawk (C)
 Western snowy plover (C)
 White-faced ibis (C)
 Long-billed curlew (C)

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68	060-068B/Floy Canyon	Black-footed ferret (E) Ferruginous hawk (C) Long-billed curlew (C) Southern spotted owl (C) Western yellow-billed cuckoo (C)
69	060-100C-2/Coal Canyon	see Map Ref. # 68
70	060-100C-1/Spruce Canyon	see Map Ref. # 68
71	060-100B/Flume Canyon	see Map Ref. # 68
72	060-118/West Water Canyon	Black-footed ferret (E) Bald eagle (E) Colorado squawfish (E) Humpback chub (E) Bonytail chub (E) <u>Cryptantha elata</u> (C) Ferruginous hawk (C) Long-billed curlew (C) Razorback sucker (C) Southern spotted owl (C) Western yellow-billed cuckoo (C)
73	080-730/Winter Ridge	Peregrine falcon (E) <u>Penstemon grahamii</u> (C) Long-billed curlew (C) Southern spotted owl (C) Ferruginous hawk (C) Western yellow-billed cuckoo (C)
A	040-147/Red Butte	see Map Ref. # 15
B	040-148/Spring Creek Canyon	see Map Ref. # 15
C	040-149/The Watchman	see Map Ref. # 15
D	040-154/Taylor Creek Canyon	see Map Ref. # 15

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|---|--------------------------------|--|
| E | 040-176/Goose Creek
Canyon | see Map Ref. # 15 |
| F | 040-177/Beartrap
Canyon | see Map Ref. # 15 |
| G | 050-221/Fremont Gorge | Peregrine falcon (E)
Long-billed curlew (C)
<u>Gilia caespitosa</u> (C)
Southern spotted owl (C)
Swainson's hawk (C)
Western yellow-billed cuckoo (C) |
| H | 060-131B/Lost Spring
Canyon | Peregrine falcon (E)
Black-footed ferret (E)
<u>Astragalus sabulosus</u> (C)
<u>Asclepias cutleri</u> (C)
Ferruginous hawk (C)
Southern spotted owl (C) |
| I | 080-414/Daniels Canyon | Peregrine falcon (E)
Black-footed ferret (E)
Ferruginous hawk (C)
Long-billed curlew (C)
Mountain plover (C)
Swainson's hawk (C)
<u>Oenothera acutissima</u> (C)
Western snowy plover (C)
Western yellow-billed cuckoo (C)
White-faced ibis (C) |

APPENDIX 5

ENERGY AND MINERAL RESOURCE RATING SYSTEM

INTRODUCTION

BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah independently assessed for its energy and mineral resources by Science Applications, Inc. (SAI, 1982).

The SAI system assigns a dual rating for each resource (e.g., f3/c2). The first rating, f3, estimates the geologic favorability (f) of the tract for the resource. The second rating, c2, is SAI's estimate, or degree of certainty (c), that the resource actually does or does not exist within the tract. Favorability and certainty are rated on a scale of 1 to 4.

In the Draft EIS, each WSA was assigned an overall importance rating (OIR). The OIR attempted to integrate the individual resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflected the group's overall assessment of the resource importance of the tract. However, this rating system was confusing to many readers, therefore, it has been deleted from the Final EIS. The WSAs for which mineral and energy exploration and development are projected in the foreseeable future are discussed in Appendix 6, Appendix 10, and the individual WSA analysis. BLM modifications of the SAI ratings are discussed in Appendix 10.

A general description of each original SAI rating follows.

The inferred past and/or current geologic processes operating in the area are believed to preclude the accumulation of the resource.

The geologic environment of the area is considered favorable for the accumulation of (1) minor deposits; (2) low-tonnage, low-grade, or low-volume resources; or (3) low-temperature geothermal resources. If these resources exist, they may or may not be economical to extract.

The geologic environment of the area is considered favorable for the accumulation of (1) medium-size (tonnage, volume) deposits; or (2) moderate-temperature geothermal resources. If these resources exist, they may or may not be economical to extract.

The geologic environment of the area is considered favorable for the accumulation of (1) large-size (tonnage, volume) deposits; or (2) high-temperature geothermal resources. If the more conventional resources exist (oil, gas, coal, and uranium), they would probably be economical to extract.

No direct data (e.g., mines, producing or abandoned wells, prospects, assays, bore holes, etc.) occur in the broad area surrounding the tract to either support or refute the existence of the resource within the tract.

No direct occurrence data are available to support or refute the existence of the resource within or near the tract. However, the tract is fairly close to direct evidence of resource occurrence, and the past geologic conditions responsible for resource accumulation in this nearby area can be inferred, with a limited amount of confidence, to have existed in the tract.

At least one piece of direct evidence (an oil or gas seep, a coal bed outcrop, a hot spring, a positive assay, etc.) is available from within or very near the tract to support or refute the existence of the resource.

Abundant direct evidence is available from within and/or very near the tract to support or refute the existence of the resource. (When a c4 certainty is used with an f1 favorability, this indicates, with a high degree of certainty, that the resource does not exist in the tract.)

Each "f" rating is correlated with the projected amount of each resource that could occur within the boundaries of each WSA. For example, an f2 rating for oil or gas indicates that up to 10 million barrels of oil and/or 60 billion cubic feet of natural gas could be in-place within the WSA. The certainty with which the projection is made is indicated by the "c" rating. The "f" rating for each mineral resource addressed by SAI is given in the Mineral and Energy Resources sections of the individual WSA analyses, Volumes II through VI. BLM modified the SAI ratings for some WSAs where more detailed mineral information was available. BLM's modifications are also noted in the individual analyses.

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A more detailed discussion of the specific criteria for the "f" and "c" ratings for each evaluated mineral or energy resource follows.

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR OIL AND GAS RESOURCES

Favorability

The organic remains that are typically contained in sedimentary rocks (such as shale and limestone) are considered by many investigators to be the chief source of the world's hydrocarbons. This organic debris is generally more abundant, accumulates more rapidly, and is much better preserved in near-shore marine environments where life is teeming, although some nonmarine environments may also contain significant accumulations of organic debris. Where such accumulations are heated during deeper burial, a series of poorly understood chemical and physical reactions transform part of the organic material into petroleum. Petroleum is an inclusive term applied to substances ranging from gaseous to solid; it includes crude oil and natural gas. Continued compaction during deep burial expels the fluid and gaseous portions of the petroleum, which may then migrate toward zones of lower pressure. (The distance that oil and gas can migrate is a matter of considerable controversy. Some geologists, on the one hand, consider migration on the order of hundreds or even thousands of miles to be possible, whereas other geologists believe that oil and gas migrate very little from the point at which they are generated.) If the transmissivity of the rocks is sufficient, and favorable reservoir rocks and traps are available, oil and gas pools can accumulate. The degree of geologic favorability of a tract for commercial oil and gas pools thus depends on the following regional or provincial characteristics: (1) thickness and volume of sedimentary rocks; (2) the presence of adequate source rock; (3) the level of maturation of the organic matter in the geologic environment; (4) the availability of both porous and permeable reservoir rock; (5) the development of reservoir traps coincident with petroleum migration; and (6) the severity of post-entrapment tectonic and geothermal activity. Many other factors can also influence the apparent favorability of a region, but the factors listed above are essential.

The anticipated size (small, medium, and large) of oil and gas pools in each of the favorability categories listed below are modified from "Reserve Estimates of New-Field Discoveries" prepared by the Committee

on Statistics of Drilling of the American Association of Petroleum Geologists. (Johnson, 1980)

Tracts designated as having the lowest favorability, "f1," for oil and gas will be within a geologic environment dominated by igneous and metamorphic rocks that constitute a regional basement at or near the surface; or by intense recent tectonic activity, particularly where characterized by pervasive fracturing or brecciation. In such areas, source rocks either do not exist or have been strongly altered, with concomitant loss of most of the contained volatiles and, in some cases, the alteration of remnant carbon to graphite. Similarly, traps or reservoir rocks either have not developed or have been altered or destroyed by intense igneous, metamorphic, and tectonic events. Consequently, in most of these present-day geologic environments, any pre-existing concentrations of oil and gas would have been vaporized by the intense heat, or lost to the hydrosphere or atmosphere upon a loss of confining pressure during fracturing and brecciation.

The geologic environment of a tract rated at the "f2" level for oil and gas is considered to have a potential only for small, widely scattered oil and gas pools. The size of recoverable hydrocarbon accumulations in such an environment would be anticipated to be less than 10 million barrels of oil or, if gas, no more than 60 billion cubic feet (volume grades D through F).

Tracts considered favorable for oil and gas at the "f3" level are within an environment that may contain either densely spaced small pools, or scattered, moderately large pools. Recoverable fluid hydrocarbons are anticipated to be between 10 and 50 million barrels of oil, or between 60 and 300 billion cubic feet of gas (volume grades B and C). The geologic environment deemed likely to host such intermediate quantities of oil and gas would generally contain a sedimentary sequence less than 5,000 feet thick. This rock sequence must be heterogeneous in composition and contain at least one organically rich marine formation to provide a hydrocarbon source. Moreover, the geologic history of the area must be such that the presence of stratigraphic and structural traps can be reasonably inferred. Finally, evidence of possible freshwater flushing or potential reservoir rocks must be minimal.

Tracts designated "f4" must be within a geologic environment that is favorable for large accumulations of oil and gas. Recoverable fluid hydrocarbons in such an environment are anticipated to be more than 50 million barrels of oil, or if gas, more than 300 billion

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cubic feet (volume grade A Johnson, 1980, p. 1301). The geologic environment must include a heterogeneous sequence of sedimentary rocks with a thickness generally well over 5,000 feet. Organically-rich marine source rocks should be relatively abundant. Numerous reservoir rocks and stratigraphic and structural traps must be confidently inferred to exist in the area based on its geologic history. Multiple oil and gas reservoirs stacked in vertical succession might be reasonably inferred to occur in this geologic environment. Recent tectonism must be at a minimum, if present at all. There should be no evidence of possible freshwater flushing of potential reservoir rocks.

Certainty

The degree of certainty of oil and gas occurrence is based on the proximity of direct evidence that either supports or refutes the existence of the resource in the immediate environment of the tract. Direct evidence includes the following: (1) surface oil and gas seeps caused by leakage from fractured reservoirs; (2) tar sands or oil-impregnated rock deposits (oil shales are nonmaturated or only partly maturated source rocks and are treated as a separate resource when required); and (3) results from exploration and development (includes wildcat, deeper- and shallower-pool tests, outpost or extension tests, and development wells).

Geophysical data, chiefly seismic, are often mistakenly assumed to provide "proof," or at least a high degree of certainty, that oil and gas resources actually occur in an area. Geophysical data, however, are no more than tools used to interpret the stratigraphic and structure of a region, as a means of determining its degree of "geologic favorability" for oil and gas. As such, geophysical data will be used as a measure of favorability, not certainty.

Data on well yield and on oil and gas quality, when and where available, are considered information and are used along with other data to estimate oil and gas resources. Such data include: flow or pumping rates for wells; specific-gravity determinations; chemical analyses for sulfur, nitrogen, and the amounts of various metal and mineral contaminants (in the case of crude oil); and hydrogen sulfide, nitrogen, carbon dioxide, and helium analyses (in the case of raw gas).

In the lowest level of certainty for oil and gas, "c1," no direct data are available to support or refute the occurrence of petroleum within the tract, regardless

of the level of geologic favorability. No wells have been drilled in or near the tract, nor are any oil or gas seeps, tar sands, or oil-impregnated sandstone deposits known in the vicinity. Positive evidence of resource occurrence is far removed from the tract, or is on a trend considered unrelated to the geology of the tract. Accordingly, the tract will not be within an "established" or generally accepted "potential" petroliferous province.

A lower-intermediate level of certainty, "c2," for oil and gas again implies that no direct data (seeps, exploratory wells, or producing wells) occur within or very near the tract being evaluated. However, positive occurrence data must be available from the vicinity of the tract; thus the tract will probably be within a petroliferous province (basin) with at least one producing or formerly commercial oil and/or gas field. Seeps, shows, or productive wells that are present at some distance along a known productive trend are considered as stronger evidence for certainty than closer in occurrences known to be off-trend. Thus, oil and gas shows as much as several miles away on-trend are better indications of certainty than those less than a mile distant but off-trend. Positive occurrence data on parallel similar-type trends, although at some distance, are considered evidence for at least a "c2" certainty.

The "c3" or higher-intermediate degree of certainty for oil or gas requires the recognition of at least one seep, a show in an exploratory well, or a producing well from within or very near the tract being evaluated. Moreover, the tract will likely be within an established petroleum-producing province. If several wells have been drilled in or near the tract, at least one must have a strong show. A "c3" rating can also be used if the rating-team consensus deems that the extrapolation of nearby positive-direct data is stronger than for a "c2" certainty. (If a number of wells from within or near the tract have been drilled and all were dry, a c3 or c4 certainty rating would be applied in conjunction with a low favorability rating.) The highest level of oil and gas certainty, "c4," is used only when the tract being evaluated lies within a well-known, productive petroliferous province. Abundant and direct evidence such as seeps, shows, or producing wells occur within or immediately adjacent to the tract. (By definition, when a "c4" certainty is used with an "f1" favorability, the dual rating indicates with a high-degree of certainty that commercial quantities of oil and gas do not occur in or near the tract.)

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SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR OIL-IMPREGNATED ROCK DEPOSITS (TAR SAND)

Favorability

The term "petroleum" applies to many substances ranging from gaseous, to liquid, to solid. The gaseous and liquid forms are referred to as natural gas and crude oil, respectively. The semi-solid and solid forms of petroleum consist of heavy hydrocarbons; that is, petroleum that has lost its volatile or lighter constituents because of exposure to the atmosphere. These deposits are variously referred to as asphalt, tar, pitch, albertite, gilsonite, grahamite, or other terms depending on the individual characteristics of the deposits and depending upon local terminology.

Heavy oils in Utah are referred to as "oil-impregnated rock deposits" by members of the Utah Geologic and Mineral Survey. These deposits are breached oil fields, accumulations of once-fluid hydrocarbons that are now at or near the land surface. For this study, we have adopted the Utah Survey's terminology, as well as the deposit-size classification developed (Ritzma, 1979).

The favorability criteria for oil and gas are generally applicable to oil-impregnated rock deposits. However, the oil-impregnated rocks are not now economical to develop, and a direct volumetric comparison with undiscovered recoverable petroleum is, in our opinion, not justifiable. Therefore, the volume of oil assigned to the various favorability levels under oil-impregnated rocks is substantially higher than the volume assigned to the corresponding favorability categories for crude oil.

An "f1" favorability rating for oil-impregnated rock is assigned to a tract in areas where porous and permeable rocks do not exist, chiefly in igneous and metamorphic terranes. It can also be assigned to rocks of sedimentary origin that are not considered to be suitable reservoir rocks.

Tracts assigned an "f2" rating are within a geologic environment favorable for oil-impregnated deposits containing less than 10 million barrels of oil in-place (size categories "minor" and "medium" according to the classification developed (Ritzma, 1979). Open-pit mining of these deposits could yield as much as 90 percent of the oil in-place, compared with a yield of only 10 to 20 percent by in-situ methods (Ritzma, 1979). Refer to the oil and gas criteria in this appen-

dix for additional details on oil generation, migration, and entrapment which are also applicable to oil-impregnated rock deposits.

Tracts assigned an "f3" rating are within a geologic environment favorable for oil-impregnated deposits containing between 10 million and 500 million barrels of oil-in-place (size categories "large" and "very large" according to the classification developed (Ritzma, 1979). Ritzma's "large" and "very large" deposits were assigned to the f3 rather than the f4 favorability category because the lower limit of Ritzma's "large" deposit corresponds to the lower limit of the f3 category for recoverable fluid petroleum (refer to oil and gas criteria). The decision to place the f3 upper limit for oil-impregnated deposits at 500 million barrels is based chiefly on the uneconomic nature of these deposits and because a direct volumetric comparison of these deposits with undiscovered recoverable recoverable petroleum is, not justifiable.

Tracts assigned an "f4" rating are within a geologic environment favorable for oil-impregnated deposits containing more than 500 million barrels of oil in-place a "giant" according to the classification (Ritzma, 1979). Refer to the discussion contained within brackets under f2 and f3 above.

Certainty

Oil-impregnated rocks, unlike many other mineral resources, usually occur over large areas, parts of which commonly intersect the land surface. Thus, the degree of certainty that oil-impregnated deposits exist can be as high as 100 percent using detection methods no more sophisticated than visual inspection. Nevertheless, for those tracts that are not known with 100 percent assurance to contain oil-impregnated rock, but are within obviously favorable environments, such as extensions of known deposits, the certainty of occurrence is something less than 100 percent. Consequently, the degree of certainty that oil-impregnated rocks exist in a tract can be based on: (1) visible, reported occurrences; (2) the proximity of the tract to known areas of oil-impregnated rock, and the inferred continuity of these deposits to the tract; and (3) the results of drill tests.

In the lowest level of certainty, "c1," no direct data are available to support or refute the occurrence of oil-impregnated rock within the tract, regardless of the level of geologic favorability. No oil-impregnated rocks are known from the region surrounding the tract, nor can any be reasonably inferred to exist

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based on lateral continuity with known deposits at great distances from the tract.

A lower-intermediate level of certainty, "c2," indicates that no direct data (outcrops and exploratory drill tests) occur within or very near the tract being evaluated. Some positive occurrence data, however, must be available from the vicinity of the tract, and the intervening geology must be such that the inference of continuity between these known occurrences and the tract is reasonable.

The "c3," or higher-intermediate degree of certainty requires the recognition of at least one oil-impregnated rock unit near the tract being evaluated. These nearby occurrences should usually be no more than a few miles from the tract, and the postulated lateral continuity of the oil-saturated formation at depth below the tract should be relatively high. Assigning a tract a "c3" rating requires a much higher degree of confidence that oil-impregnated rocks actually occur in the tract compared with a "c2" rating.

The highest level of certainty, "c4," is used only when the tract being evaluated is known to contain oil-impregnated rocks, regardless of the associated favorability. (By definition, when a "c4" certainty is used with an "f1" favorability, the dual rating indicates with a high degree of certainty that oil-impregnated rocks do not occur in or near the tract.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR OIL SHALE

Favorability

Oil shale is a fine-grained sedimentary rock containing organic matter that, upon heating, can yield a large volume of oil. The United States contains an enormous amount of identified oil shale, although the bulk of the resource occurs in the Green River Formation in Colorado, Wyoming, and Utah. The U.S. Geological Survey estimates that more than 2 trillion barrels of oil occur in oil shales in the United States having an average yield of 15 or more gallons of oil per ton of rock (USDI, USGS, 1973).

Deposits of oil shale occur in many parts of the country and they range in age from Ordovician to Tertiary. Most oil shales are associated with lacustrine rocks, marine shales, and shale deposited with coal-bearing rocks. The organic fraction of the lacustrine shales is derived from algae and other microorgan-

isms that flourished in the central part of the shallow lakes that existed in subtropical climates. Oil shales originating in this environment, such as the Parachute Creek Member of the Green River Formation, can contain up to 2,000 feet of alternating rich and lean beds of oil shale.

The oil shales of marine origin consist of two types, those associated with continental platforms and those associated with geosynclinal basins. The volume of marine oil shale (and the contained potential oil) far exceeds that of oil shales of lacustrine origin. Nevertheless, these deposits (such as the Chatianoga Shale and equivalent shales in the eastern and central U.S.) are typically less than 100 feet thick and have an average oil yield of only about 5 gallons per ton of rock.

The oil shales associated with coal beds (sometimes called carbonaceous shales) are generally thin, of limited areal extent, and exhibit considerable lateral variation in organic content. Some of these shales may locally yield up to 100 gallons of oil per ton of rock, but most yield less than 10 gallons.

We emphasize that the geologic favorability for oil shale, even at the highest level of favorability, is not dependent upon whether these deposits can be developed economically. In fact, recent announcement by the oil shale industry, such as Exxon's cancellation in 1982 of a large-scale mining operation in the Piceance Creek Basin in northwestern Colorado, have raised many questions regarding the profitability of oil shale through at least the end of this century. The economics of developing oil shale are not considered in the favorability ratings, but they are taken into account at the time the WSA is assigned an OIR.

An "f1" favorability rating for oil shale is assigned to a tract in areas composed of igneous and metamorphic rocks. It can also be assigned to a tract where the rocks, although of sedimentary origin, originated in environments that are not normally associated with oil shale, such as eolian environments. (Favorable geologic environments for oil shale at depths exceeding a few hundred feet below the surface are not considered in the evaluation, unless there are compelling reasons to do so.)

Tracts assigned an "f2" rating are within a geologic environment favorable for thin beds of oil shale (a few tens of feet thick, regardless of the potential oil yield), or within a geologic environment favorable for moderately thick beds of low-yield oil shale (beds

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exceeding 100 feet thick, but with an oil yield of less than 15 gallons per ton of shale). Geologic environments at the f2 level could include (1) shallow continental shelves; (2) parts of a miogeosyncline that are associated with deposits of limestone, phosphorite, and chert; and (3) the periphery of large, shallow lakes that existed in subtropical environments.

Tracts assigned an "f3" rating are within a geologic environment favorable for moderately-thick beds of oil shale (a few hundred feet thick) with an estimated average oil yield of about 15 gallons per ton of shale. In general, only the more central parts of pre-existing lacustrine environments, and some miogeosynclinal subbasins, would meet these criteria.

Tracts assigned an "f4" rating are within a geologic environment favorable for thick and rich deposits of oil shale, at least a few hundred feet thick, with an estimated average oil yield of at least 25 gallons per ton of shale. In general, only the central, organic-rich parts of pre-existing lacustrine environments would meet these criteria.

Certainty

Oil shales, unlike many other mineral resources, occur over large areas, parts of which commonly intersect the land surface. Thus, the degree of certainty that oil shales exist can be as high as 100 percent using detection methods no more sophisticated than visual inspection. Nevertheless, for those tracts that are not known with 100-percent assurance to contain oil shale, but are within obviously favorable environments, such as extensions of known deposits, the certainty of occurrence is something less than 100 percent. Consequently, the degree of certainty that oil shales exist in a tract can be based on: (1) visible, reported occurrences; (2) the proximity of the tract to known areas of oil shale, and the inferred continuity of these deposits to the tract; and (3) the results of drill tests.

In the lowest level of certainty, "c1," no direct data are available to support or refute the occurrence of oil shale within the tract, regardless of the level of geologic favorability. No oil shales are known from the region surrounding the tract, nor can any be reasonably inferred to exist based on lateral continuity with known deposits at great distances from the tract.

A "c2" degree of certainty indicates that no direct data (outcrops of oil shale or exploratory drill tests)

occur within or very near the tract being evaluated. Some positive occurrence data, however, must be available from the vicinity of the tract, and the intervening geology must be such that the inference of continuity between these known occurrences and the tract is reasonable.

A "c3" degree of certainty requires the recognition of at least one bed or zone of oil shale (or carbonaceous shale) near the tract being evaluated. These nearby occurrences should usually be no more than a few miles from the tract, and the postulated lateral continuity of the oil shales at depth below the tract should be relatively high. Assigning a tract a "c3" rating requires a much higher degree of confidence that oil shales actually occur in the tract compared with a "c2" rating.

The highest level of certainty, "c4," is used only when the tract being evaluated is known to contain oil shale, regardless of the associated favorability. (By definition, when a "c4" certainty is used with an "f1" favorability, the dual rating indicates with a high degree of certainty that oil shales do not occur in or near the tract.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR COAL RESOURCES

Favorability

The raw material that is eventually transformed into coal originates in deltaic, swampy, lagoonal, and near-shore lacustrine environments where huge quantities of organic debris accumulate and are then slowly buried in a reducing environment. With the passage of time, the organic material is compacted into coal under the weight of overlying sediments. The eventual "rank" of the coal is defined by the fixed carbon and heat content on a mineral-free basis. Changes in coal rank from lignite to subbituminous, bituminous, and finally anthracite, are related to a progressive decrease in the content of moisture and other volatiles. This change is the result largely of the rate, duration, and severity of metamorphism of the organic matter by the depth and heat of burial, and by the degree of structural deformation through time. "Grade," on the other hand, is a measure of the quality or purity of the coal and is determined by the content of ash, sulfur, and other deleterious materials.

Based on the discussion above, the level of favorability of the geologic environment for coal resources

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depends on (1) the geologic age of the rocks (considering that abundant plant life is clearly necessary); and (2) the lithology of the rock units and the environment of deposition of these sediments.

An "f1" favorability rating for coal is assigned to a tract in areas where extensive igneous and metamorphic rocks are at or near the surface. It can also be assigned where rocks, although sedimentary in origin, were deposited in environments not normally associated with coal, such as in off-shore marina environments. Moreover, any areas that consist only of pre-Devonian sedimentary rocks can be designated as f1, because land plants, the prime requisite for coal, did not evolve until that time.

Tracts rated "f2" are within a geologic environment favorable for only small tonnages of coal, or in thin, discontinuous seams (considerably less than 28 inches thick for bituminous or higher ranks, and considerably less than 5 feet thick for subbituminous or lower rank coals). Such coals would more than likely have formed in lagoonal or deltaic channel-fill marshes, and the age of these coals might not be equivalent to the age of the major coal-bearing rocks in the region.

Tracts rated "f3" are within a geologic environment favorable for moderate tonnages of coal (approximately 28 inches thick for bituminous or higher ranks, or about 5 feet thick for subbituminous or lower rank coals). The major coal-bearing units in the region should be recognized within the tract, but the tract will probably be located in the more peripheral parts of the original coal basin(s).

Tracts rated "f4" are within a geologic environment favorable for large tonnages of coal (greater than 28 inches thick for bituminous or higher ranks, or greater than 5 feet thick for subbituminous or lower rank coals). The major coal-bearing units in the region should be recognized within the tract, and the tract will be located in the central parts of the original coal basin(s) where the coal deposits are likely to be thicker and more continuous.

Certainty

Coal, unlike many other resources, usually occurs as large tabular bodies, parts of which commonly intersect the land surface. Also, in contrast to other mineral resources, coal is a primary deposit formed contemporaneously with the enclosing sediments. Thus, the degree of certainty that the resource occurs,

even over very large areas, can be as high as 100 percent using detection methods no more sophisticated than visual inspection. Nevertheless, for those tracts that do not contain outcrops of coal, but are within obviously favorable environments such as a coal basin, the certainty of occurrence is something less than 100 percent. Consequently, the degree of certainty that coal occurs in a tract can be based on (1) visible, reported occurrences, which includes formerly or currently productive deep mines; (2) the proximity of the tract to known coal beds and the inferred continuity of these coal beds at depth within the tract; and (3) the results of drill tests.

In the lowest level of certainty, "c1," no direct data are available to support or refute the occurrence of coal within the tract, regardless of the level of geologic favorability. No coal outcrops are known from the region surrounding the tract, nor can any coal beds be reasonably inferred to exist based on lateral continuity with known coal beds at great distances from the tract. Accordingly, the tract will be far removed from any established or prospective coal basins.

A lower-intermediate level of certainty, "c2," for coal again implies that no direct data (outcrops, exploratory drill tests, or former coal mines) occur within or very near the tract being evaluated. However, positive occurrence data must be available from the vicinity of the tract, and the intervening geology must be such that the inference of continuity between these known occurrences and the tract is reasonable. Accordingly, a tract assigned a "c2" certainty rating will probably be within a generally recognizable coal basin.

The "c3," or higher-intermediate, degree of certainty for coal requires the recognition of at least one coal-bearing formation, or an abandoned or active coal mine, very near the tract being evaluated. Nearby occurrences should usually be no more than 5 miles from the tract, although site- or area-specific information may indicate the use of greater or lesser distances. Assigning a tract a "c3" rating requires a much higher degree of confidence that coal actually occurs in the tract compared with a "c2" rating.

The highest level of coal certainty, "c4," is used only when the tract being evaluated is known to contain coal beds, regardless of the associated favorability. (By definition, when a "c4" certainty is used with an "f1" favorability, the dual rating indicates with a

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high degree of certainty that commercial quantities of coal do not occur in or near the tract.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR POTASH RESOURCES

General

Potassium (or potash) is a vital chemical element used to promote plant growth and increase crop yield. About 95 percent of the potash consumed in the United States is used in fertilizers.

Most potash is obtained from bedded deposits by underground mining. Where the deposits are too deep, generally more than 3,000 or 4,000 feet below the surface, solution mining methods are used. Smaller amounts of potash are also derived from evaporation of salt lakes and from subsurface brines.

Potassium occurs in igneous, metamorphic, and sedimentary rocks. About 95 percent of potash reserves, however, are contained in bedded sedimentary deposits of various geologic ages that originated from evaporation of restricted bodies of sea water. The potassium is contained largely in the mineral sylvite and in other potassium-magnesium minerals that occur in tabular bodies a few tens of feet thick covering several square miles (USDI, USGS, 1973). The other 5 percent of potash reserves are contained in natural brines that originated largely by evaporation of Pleistocene lakes. Potash reserves of both the world and North American are enormous.

Favorability

The favorability of a geologic environment for potash is based on the identification of paleo-evaporitic basins. Of the 69 evaporite deposits (basins) identified in the U.S. (USDI, USGS, 1973). Only seven are known to contain potassium minerals. The scarcity of potash in evaporite basins is the result of the order in which minerals are precipitated from sea water. In general, potash minerals precipitate only after extreme evaporation and always within the sodium-rich (halite) facies of an evaporite sequence. Thus, in the most favorable geologic environments for potash, a suitable paleo-topography and paleo-climate that tend to favor extreme evaporation, barrel basins, and characteristic sediments (halite, gypsum, anhydrite, etc.) should be identifiable.

The tonnage of potash assigned to the various favorability levels are listed below (USDI, USGS, 1981).

WSAs assigned to the "f1" category are unfavorable for potash. None of the geologic characteristics that are normally associated with bedded potash deposits, such as a paleo-evaporite basin, can be identified within the WSA.

WSAs assigned an "f2" rating are within a marginally favorable geologic environment for potash. Although the WSA will contain some rocks that originated in an evaporitic environment, the geologic data suggest that the climate within the basin was not particularly arid or long-lived. If, on the other hand, a large paleo-evaporitic basin is believed to have existed in the region, geologic data suggest that the WSA lies along the basin's periphery. If deposits occur in this environment, they will generally contain less than about 1,000,000 tons of potash.

WSAs assigned an "f3" rating are within a moderately favorable geologic environment for potash. The WSA will contain some evaporite deposits such as halite and gypsum, and the geologic data suggest that the climate within the basin was sufficiently arid and long-lived so that widespread, moderately thick beds of relatively pure potash accumulated. If deposits occur in this environment, they will generally contain between 1,000,000 and 10,000,000 tons of potash.

WSAs assigned an "f4" rating are within a highly favorable geologic environment for potash. The WSA will contain evaporite deposits such as halite and gypsum, and the geologic data suggest that the climate and topography within the basin was sufficiently arid and long-lived so that widespread, thick beds of very pure potash accumulated. If deposits occur in this environment, they will generally contain more than 10,000,000 tons of potash.

Certainty

The degree of certainty that potash occurs in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of potash within the WSA. The following data can be used to support the various certainty levels: (1) the reported occurrence of potash from oil and gas exploration; and (2) active or once productive mines.

In the lowest level of certainty, "c1," no direct data are available to support or refute the occurrence of

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potash within the WSA, regardless of the level of geologic favorability. No beds of potash-bearing rocks are known from the region surrounding the WSA, nor can any be reasonably inferred to exist in the WSA based on lateral continuity with known potash-bearing rocks at great distances from the WSA. Accordingly, the WSA will be far removed from an established or prospective evaporite basin.

A "c2" certainty level for potash again implies that no direct data occur within or very near the WSA being evaluated (data such as exploratory oil and gas wells, exploratory drill tests, or former mines and prospects). Some data must be available from the vicinity of the WSA, and the intervening geology must be such that an inference of continuity between these known occurrences and the WSA is reasonable. Accordingly, a WSA assigned a "c2" certainty rating will be within a recognized evaporite basin.

The "c3" degree of certainty for potash requires the subsurface recognition (on the basis of well data) of at least one potash-bearing formation or an abandoned or active potash mine very near the WSA being evaluated. Nearby occurrences should usually be no more than a few miles from the WSA, although site- or area-specific information may indicate the use of greater or lesser distances. Assigning a WSA a "c3" rating requires a much higher degree of certainty that potash-bearing rocks actually occur in the WSA, compared with a "c2" rating.

A "c4" is assigned only when it is known that potash-bearing rocks underlie the WSA, regardless of the assigned favorability. (By definition, when a "c4" certainty is used with an "f1" favorability, it indicates with a high degree of certainty that potash-bearing rocks do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR PHOSPHATE RESOURCES

General

Phosphorous is an essential element for soil fertility and plant growth. The United States is the largest producer of phosphate rock, accounting for 40 percent of total world production in 1978 (the term "phosphate rock" is applied to any rock containing more than about 20-percent phosphate). About 70 percent of domestic consumption of phosphate rock is used in fertilizers. Other uses include animal-feed supplements, detergents, insecticides, electroplating and polishing

of metals, medicines, and munitions. Approximately 27 percent of the phosphate rock produced in the U.S. during the past few years has been exported, and about 33 percent was converted into fertilizer and chemicals for export. On the basis of current estimates, domestic reserves of phosphate rock are considered adequate for at least the next 20 years (USDI, USBM, 1980b).

Phosphate rock was produced by 26 companies in the United States in 1981. Twelve companies in Florida contributed 83 percent of the total estimated U.S. production of 57,000,000 tons. The remaining 17 percent of U.S. production was distributed as follows: 6 percent from North Carolina; 8 percent from Idaho, Alabama, Montana, and Utah; and 3 percent from Tennessee. When phosphate rock is treated with sulfuric acid to produce phosphoric acid, a large amount of fluorine is recovered as fluosilicic acid. Some companies also extract uranium as a byproduct during production of phosphoric acid. In addition, phosphate rock generally contains vanadium, scandium, and rare earths, and some of these materials have been extracted during production of phosphoric acid.

Phosphorous is mined from three principal sources, sedimentary deposits of marine origin (commonly referred to as phosphorite, guano, and deposits in igneous rocks). About 80 percent of world production is derived from marine phosphorites, 17 percent from igneous rocks, and 3 percent from guano. Essentially all U.S. production is from marine phosphorites. Phosphate resources in the United States associated with igneous rocks and guano are considered to be very small and are not discussed in the paragraphs below (USDI, USGS, 1973).

Favorability

The favorability of a geologic environment for marine phosphorite depends on the depositional history of the sedimentary rocks being evaluated. In general, phosphorite deposits originate in warm climates, commonly within the tradewind belts where cold and warm waters mix. Cold, deep ocean waters are nearly saturated with phosphate. Where these cold waters are brought in contact with warm surface waters, such as in areas of upwelling, the phosphate becomes less soluble and the phosphate mineral apatite may then be deposited by organic or inorganic means, commonly as pellets, some nodules, and less frequently as phosphatized bone and shell fragments. Because most of the sedimentary basins in the United States have already been discovered, almost all U.S. phosphate

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resources are classed as either identified or hypothetical; very little of our phosphate resource is classed as speculative.

Phosphorite deposits form in three fairly distinct geologic environments. The richest and largest deposits occur along the west coasts of continents, in shallow, slowly-subsiding marine basins within those parts of the miogeosyncline where the influx of clastic substances is minimal and where cold, upwelling water is abundant. Individual phosphate beds may be several feet thick, extend over hundreds of square miles, and contain 30 percent or more phosphate. Rocks commonly associated with phosphorite in this environment include black shale and phosphoritic shale in the deeper parts of the basin, and dolomite, chert, evaporites, and light-colored sandstones nearer to shore.

A second and somewhat less favorable environment for the accumulation of phosphorites is along the east coast of continents where warm-water currents are in contact with colder waters. These deposits are usually lower in grade than the miogeosynclinal deposits and they are economic only where they have been reworked by submarine currents and/or subjected to weathering. The most important of these deposits are associated with structural basins within the continental shelf where phosphorite may be deposited in areas of upwelling or where cool countercurrents mix with warm surface currents as in an estuarine environment.

The third environment for phosphorites is within continental interiors or stable continental shelves. Individual beds formed in this environment are usually only a few feet thick and generally contain only 5 to 15 percent phosphate, although individual phosphorite nodules may contain as much as 35 percent. Phosphate reserves associated with this geologic environment are minor.

The tonnage of phosphate rock assigned to the various favorability levels are listed below (USDI, USGS, 1981). Areas in the U.S. that have been outlined according to their preliminary favorability for phosphate rock (USDI, USGS, 1979). In general, and unless stated otherwise, only rocks to a depth of 1,000 feet are evaluated for phosphate favorability.

WSAs assigned to the "f1" category are unfavorable for phosphate rocks. None of the geologic characteristics that are normally associated with phosphate deposits can be identified within the WSA.

WSAs assigned an "f2" rating are within a marginally favorable geologic environment for phosphate rocks. In general, the sedimentary rocks underlying the WSA contain large amounts of clastic material that originated along a stable shelf or within the interior of a continent. If phosphorite occurs in this environment, deposits will generally contain less than 200,000 tons of phosphate (at a grade of at least 24 percent).

WSAs assigned an "f3" rating are within a moderately favorable geologic environment for phosphorite. The sedimentary rocks considered favorable within the WSA should have originated near a structural basin close to a relatively stable platform, or near a basin within the miogeosyncline. Therefore, some evidence for the prior existence of a structural basin should be available. A sequence of shale, chert, and carbonate rocks should be recognized within the area because of the close association of this rock sequence with phosphorite (for miogeosynclinal phosphorites). If phosphorite exists in this environment, deposits will generally contain between 200,000 and 200,000,000 tons of phosphate (at a grade of at least 24 percent).

WSAs assigned an "f4" rating are within a highly favorable geologic environment for phosphate. The sedimentary rocks within the WSA considered favorable should have originated in a structural basin close to a relatively stable platform, or in a basin within a miogeosyncline. Evidence for the prior existence of this structural basin should be available. Clastic material in the sequence of rocks assigned with favorability level should be minimal. The favorable rock sequence should therefore be thin when compared with laterally equivalent sedimentary rocks. A sequence of shale, chert, and carbonate rocks should be recognized within the area because of the close association of this rock sequence with phosphorite (for miogeosynclinal phosphorites). Anomalous amounts of uranium may be present in streams in the area. If phosphorite exists in this environment, deposits will generally contain more than 200,000,000 tons of phosphate (at a grade of at least 24 percent).

Certainty

The degree of certainty that phosphate occurs in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of phosphate within the WSA. The following data can be used to support the various certainty levels: (1) the known occurrence of phosphate rocks at the surface; (2) the reported occurrence of

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phosphate rock from oil and gas exploration or other types of mineral exploration; and (3) active or once-productive phosphate mines.

At the "c1" certainty level, no direct data are available to support or refute the occurrence of phosphate within the WSA, regardless of the level of geologic favorability. No outcrops of phosphate rocks are known from the region surrounding the WSA, nor can any be reasonably inferred to exist in the WSA based on lateral continuity with known beds of phosphorite at great distances from the WSA. Accordingly, the WSA will be far removed from an established or prospective phosphate field.

A "c2" certainty level for phosphate rock again implies that no direct data (outcrops, exploratory drill tests, or former mines and prospects) occur within or very near the WSA being evaluated. However, positive occurrence data must be available from the vicinity of the WSA, and the intervening geology must be such that an inference of continuity between these known occurrences and the WSA is reasonable. Accordingly, a WSA assigned a "c2" certainty rating will usually be within a generally recognized phosphate field.

The "c3" degree of certainty for phosphate rock requires the recognition of at least one phosphate-bearing formation, or an abandoned or active phosphate mine very near the WSA being evaluated. Nearby occurrences should usually be no more than a few miles from the WSA, although site- or area-specific information may indicate the use of greater or lesser distances. Assigning a WSA a "c3" rating requires a much higher degree of certainty that phosphate rock actually occurs in the WSA, compared with a "c2" rating.

A "c4" certainty rating is assigned only when it is known that phosphate rock occurs within the WSA, regardless of the associated favorability. (By definition, when a "c4" certainty is used with an "f1" favorability, it indicates with a high degree of certainty that phosphate rock does not occur in or near the WSA).

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR URANIUM RESOURCES

General

Assessment of the Nation's uranium resources is the responsibility of the National Uranium Resource Evaluation (NURE) program within the Department of Energy. The definitions of potential uranium resource used herein (speculative, possible, and probable) are those defined and used by NURE geologists (USDOE, 1980.)

Favorability

Commercial uranium deposits are those that have a sufficient uranium content to be mined economically now or in the next several decades by existing or predictable technologies. The chief type of uranium deposit currently mined domestically is the epigenetic accumulation in relatively young sandstones of the Colorado Plateau and Wyoming basins. Other, much larger, types of deposits are exploited throughout the world, chiefly from Precambrian rocks. Some of these larger types that have potential in the United States include (1) vein and related deposits in igneous and metamorphic rocks; (2) concentrations in quartz-pebble conglomerates; and (3) unconformity-related deposits. In addition, low-grade (less than 0.01 percent uranium oxide) accumulations in phosphorites and Paleozoic black shales could also contribute to our domestic needs in the future.

Favorability

The geologic favorability for uranium in a tract is based on the tonnage of potential uranium resources estimated to occur within the tract. These estimates are based chiefly on NURE data that are then combined with other geologic data to determine the tract's favorability. The tonnage values used to help establish geologic favorability are as follows: f1 = unfavorable for uranium; f2 = less than 500 tons uranium oxide; f3 = 500 to 1,000 tons uranium oxide; and f4 = more than 1,000 tons uranium oxide.

The costs of producing a specified amount of uranium are called "forward costs." They include capital and operating costs that are incurred in producing the uranium, but not the costs of acquiring the lands, exploration, mine development, and mill construction, or taxes, profit, and other items. The forward costs, being entirely economic factors, are used (when available) to estimate uranium resource.

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The origin of large uranium deposits requires the coincidence of several geologic conditions: (1) a source rock with readily leachable uranium or with uranium-mineral resistates; (2) sufficient water and adequate conduits to transport the uranium in solution, or as solid detrital mineral grains (complexing agents are needed to form the solute if the transporting solutions are oxidizing); and (3) a geologic environment where suitable reducing agents can combine with the transporting solutions to precipitate uranium minerals, or where detrital resistates can be concentrated. The absence of any one of these conditions in or near a tract being evaluated will preclude the accumulation of most types of uranium deposits, and thus reduce the tract's geologic favorability for uranium resources.

Because of the variety of geologic environments in which uranium can occur, it would be far too lengthy to characterize each and every environment in terms of the four favorability levels listed below. Nevertheless, the reasons used to assign a tract a specific favorability level must be clearly stated in the tract report.

Tracts assigned to the "f1" category are unfavorable for uranium. In general, the geologic environment of the tract contains none of the three general favorability criteria cited above.

Tracts assigned to the "f2" favorability category are estimated to contain potential resources of less than 500 tons uranium oxide. A review of relevant geologic data shows the prominence of only one of the three favorability criteria mentioned above under "General," with but minimal evidence for the other two. Thus, the geologic environment is only marginally favorable for uranium. For example, a thick sandstone aquifer may be assigned an "f2" favorability if only limited amounts of both source and reducing materials are available.

Tracts assigned an "f3" favorability are estimated to contain potential resources of 500 to 1,000 tons uranium oxide. Thus, the three conditions for a uranium accumulation, a source, transport mechanisms and conduits, and chemical precipitation and concentrations, must be identified. For sandstone-type deposits, the geologic sequence must contain at least one porous sandstone and a zone of readily leachable uranium (such as felsic tuffaceous debris) to provide the uranium source and transport mechanism. In addition, a reductant, such as carbonaceous debris, coal frag-

ments, or fluid hydrocarbons, must be reasonably inferred to exist alone or within this sandstone body.

Tracts assigned an "f4" rating are within a geologic environment favorable for uranium resources in excess of 1,000 tons uranium oxide. For a tract to be assigned an "f4" rating, all three of the primary criteria mentioned previously must be present in sufficient abundance to indicate the tonnages of potential resources indicated. In the case of sandstone-type deposits, this would imply multiple-source and conduit zones with an abundance of reductants.

Certainty

Certainty of uranium-resource occurrence is based on the proximity of direct evidence that either supports or refutes the presence of uranium within the tract. The following evidence can be used to support the four certainty levels: (1) the visible occurrence of uranium minerals, as in mineralized fault breccias; (2) active or once productive uranium mines, or known deposits or prospects; (3) geochemical sampling, including water, sediment, soil and rock; (4) geophysical data which can selectively measure uranium content (this does not include standard gamma-ray bore-hole logs which measure all types of radioactivity); and (5) uranium assays from core samples.

No direct data are available to either support or refute the existence of uranium in the tract, regardless of the level of geologic favorability. There are no surface occurrences, mines, or known deposits in the vicinity of the tract. The rock formations which underlie the tract are not known to contain uranium in the host geologic province and, therefore, the tract is well outside of any generally recognized resource area. Geochemical surveys and/or exploration drilling are not known to have been conducted in the area.

The "c2" level of certainty implies that positive data, though somewhat limited, exist in the vicinity of the tract. At a minimum, one prospect, uranium assay, or deposit is known in the area, but the extrapolation of "continuity" from this occurrence to the tract is tenuous. The results of an initial geochemical sampling program can be used at this certainty level to either support or refute the existence of uranium deposits within the tract. This level of certainty would generally correspond to the part of NURE's "speculative potential" classification wherein the potential resources are reported as "undiscovered" deposits.

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Visible occurrences of uranium minerals, prospects, a mine, or assays from within or near the tract must be identified in order to assign a tract a certainty rating of "c3." Uranium assays of core samples taken in the vicinity of the tract from several exploration holes, or a cluster of anomalously high uranium values from geochemical samples, would be evidence for a "c3" rating. A "c3" certainty level would generally correspond to the the part of NURE's "possible potential" resources anticipated in "undiscovered" deposits; it would also include "speculative potential" resources assigned to "partly defined" deposits. (If a relatively complete drilling or sampling program had been conducted in the vicinity of the tract with negative results, a high certainty rating [c3 or c4] would be applied in conjunction with a low favorability rating.)

The highest degree of certainty, "c4," is applied to those tracts which lie in a well established uranium district, with at least one mine or deposit (from which uranium is or has been produced) within the tract boundaries. The "c4" level of certainty would correspond not only to NURE's "probable potential" resource classification, but also to the "partly defined" deposits of the "possible potential" class; it will obviously also include any uranium resources classified as reserves.

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR COPPER RESOURCES

Favorability

Economic copper deposits are those that can be mined profitably now or in the near future. The five chief types of copper deposits are: (1) porphyry and genetically related types; (2) strata-bound deposits in sedimentary rocks; (3) sulfide deposits in volcanic rocks; (4) deposits associated with nickel ores in mafic igneous rocks; and (5) native copper deposits. More than 90 percent of the world's copper resources are contained in the first two deposit types listed above (USDI, USGS, 1973).

Copper is transported to the earth's crust by igneous intrusions and mineralized solutions. Ore deposits that result directly from these processes include porphyry and vein-type deposits. Copper can also be remobilized by chemical and mechanical weathering and reconcentrated as strata-bound accumulations in favorable sedimentary rocks.

Crustal rocks average contain about 50 parts per million copper, but much larger concentrations can occur in a variety of geologic environments as outlined briefly above. A complete characterization of each deposit type for the favorability levels listed below (f2, f3, and f4) would therefore be very lengthy. Furthermore, such detailed characterizations would probably not be of immediate use to the geologist trying to assist the land manager with a land-use decision. Thus, as a first step in determining WSA favorability for copper, the "copper province map" has been adopted (USDI, USGS, 1980b). This map, similar to other previously published mineral and metallogenic maps, illustrates favorable areas (provinces) in the conterminous U.S. for copper deposits. To the extent possible, USGS characterized the type and size of copper deposits that could be anticipated within each province, as well as the overall copper resource potential of each province. In addition, the deposit sizes associated with the f2, f3, and f4 favorability levels are based on other USGS data (USDI, USGS, 1981).

In practice, the copper favorability of a WSA is evaluated for each type of copper deposit, regardless of whether or not the WSA lies within a copper province. These evaluations, however, can usually be done rapidly because it is very unlikely that a WSA will contain all the geologic environments that are favorable for the various types of copper deposits. In general, and unless stated otherwise, only the surface and near-surface rocks within a WSA, those to depths of about 1,000 feet, are evaluated for copper favorability. Favorable rocks that may exist at greater depths within the WSA are not considered in these evaluations unless there are compelling reasons to do so.

WSAs assigned to the "f1" category are unfavorable for copper. None of the geologic characteristics that are normally associated with the major types of copper deposits can be identified in the area being evaluated.

WSAs assigned an "f2" rating are marginally favorable for copper. If deposits exist in this geologic environment, they will generally be small, less than 50,000 tons of contained copper metal. In general, a WSA assigned an "f2" copper favorability will be within a copper province considered by most investigators to have a low resource potential. In general, igneous intrusive rocks will not occur in the area, thus precluding porphyry- and replacement-type deposits. The geologic environment is at best favorable for small copper deposits associated with late

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Paleozoic and Mesozoic sandstones such as those on the Colorado Plateau that generally do not occur in large, high-grade, and isolated accumulations (the cumulative tonnage of low-grade, red-bed copper deposits, however, may be very large because they can occur over broad areas).

WSAs assigned an "f3" rating are moderately favorable for copper. If deposits exist in this geologic environment, they can be expected to contain between 50,000 and 1,000,000 tons of contained copper. In general, a WSA assigned an "f3" copper favorability will be within a copper province considered by most investigators to have at least a moderate resource potential. The geologic environment of the WSA should be similar, in many respects, to the geology of areas that contain deposits of this size, regardless of the distance from the WSA. Some of the more specific characteristics, however, such as zones of highly fractured rocks in the case of porphyry deposits, may be lacking. In any case, the specific deposit types (models) that are applied to the WSA must be stated clearly in the WSA report, along with the reasons for the estimated favorability.

WSAs assigned an "f4" rating are the most favorable for copper. If deposits do occur in this geologic environment, they can be expected to contain more than 1,000,000 tons of contained copper. In general, a WSA assigned an "f4" copper favorability will be within a copper province considered by most investigators to have a high resource potential. The specific geologic characteristics of the WSA should be similar in almost all respects to the geology of areas that contain deposits of this size, regardless of the distance separating these deposits from the WSA.

Certainty

The degree of certainty that copper resources occur, or do not occur, in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of copper in the area. The following data can be used to support the various certainty levels: (1) the reported visible occurrence of copper minerals in or near the WSA; (2) active or once-productive mines, or known deposits and prospects; (3) the results of geochemical sampling of water, sediment, soil, or rock; and (4) the results of rock assays. Geophysical surveys, particularly the various types of electrical methods frequently used in copper exploration, can merely enhance (or reduce) the geologic favorability, the results of these studies do not affect the certainty of occurrence.

No direct data are available to either support or refute the existence of copper in the WSA, regardless of the assigned copper favorability rating. There are no surface occurrences, mines, or known deposits in the vicinity of the WSA. The rock formations underlying the WSA are not known to contain copper deposits or occurrences in this geologic province. Geochemical surveys and/or exploration drilling for copper are not known to have been conducted in the area. The WSA will be well outside of any generally recognized copper mining region.

The "c2" certainty level implies that some data, though somewhat limited, exist in the vicinity of the WSA. At a minimum, one prospect, rock assay, or deposit is known from the area, but the extrapolation of "continuity" from this occurrence to the WSA is at best tenuous. The results of an initial geochemical survey can be used at this certainty level to either help support or refute the existence of copper resources within the WSA.

At the "c3" certainty level, visible occurrences of copper minerals, prospects, mines, or rock assays must be reported from within or near the WSA. In general, the WSA will be within or very near an established copper mining district. A "c3" rating can also be used if the rating team consensus deems that the extrapolation of nearby direct data warrants a "c3" rather than a "c2" rating.

The "c4" certainty for copper can be applied to those WSAs that lie in a well established copper mining district, providing that a mine, deposit, or significant occurrence is within or very near the WSA (and assuming, of course, that the geology of the WSA is similar to the geology of the areas containing the copper deposits). All things being equal, a "c4" rather than a "c3" rating is applied if copper occurrences and prospects occur abundantly in the general vicinity of the WSA. (By definition, when a "c4" certainty is used with an "f1" favorability, it indicates with a high degree of certainty that copper resources do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR LEAD AND ZINC RESOURCES

General

Lead and zinc are essential metals for an industrial society and are used in a wide variety of materials. Of the 950,000 metric tons of lead consumed in the

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United States in 1981, 65 percent was used in batteries and gasoline additives, with the remainder used in construction, paints, ammunitions, electrical products, and other small uses (USDI, USBM, 1982). Of the 1,140,000 metric tons of zinc consumed in the U.S. in 1981, 40 percent was used in construction materials, 19 percent for transportation equipment, 18 percent for machinery and chemicals, 12 percent for electrical equipment, and 11 percent for other uses (USDI, USBM, 1982). Missouri is the chief lead-mining State, whereas Tennessee, Missouri, New York, and Idaho contributed the bulk of the nation's domestic supply of zinc. In 1981, imports accounted for 10 percent of the nation's consumption of lead and 67 percent of its consumption of zinc.

Favorability

Lead and zinc occur in many diverse geologic environments. Lead and zinc often occur together, and in various combinations with silver, antimony, bismuth, cadmium, copper, and other materials. Much of our domestic supply, however, comes from deposits containing only lead or zinc (USDI, USGS, 1973). Ore deposits of lead occur chiefly as the lead sulfide galena, and ore deposits of zinc occur chiefly as the zinc sulfide sphalerite. The chief types of lead and/or zinc deposits are (1) strata-bound deposits of syngenetic origin in sedimentary rocks; (2) strata-bound deposits of epigenetic origin in sedimentary rocks; (3) volcano-sedimentary deposits; (4) replacement deposits; (5) veins; and (6) supergene enrichment or laterization (USDI, USGS, 1973).

A complete characterization of each type of lead and zinc deposit mentioned above for the various favorability levels below (f2, f3, f4) would be very lengthy. Furthermore, such a detailed characterization would probably not be of immediate use to the geologist trying to assist the land manager with a land-use decision. As a first step in determining WSA favorability for lead/zinc, the "lead province map" (USDI, USGS, 1980c) and the "zinc province map" (USDI, USGS, 1980d). These maps, similar to other previously published mineral and metallogenic maps, illustrate favorable areas (provinces) in the conterminous U.S. for lead and zinc deposits. To the extent possible, USGS characterized the type and size of lead and zinc deposits that could be anticipated within each province, as well as the overall lead/zinc resource potential of each province (USDI, USGS, 1980d). The deposit sizes associated with the f2, f3, and f4 favorability levels are also based on other USGS data (USDI, USGS, 1981).

In practice, the lead/zinc favorability of a WSA is evaluated for each type of lead and/or zinc deposit, regardless of whether or not the WSA lies within a lead and/or zinc province. These evaluations, however, can usually be done rapidly because it is very unlikely that a WSA will contain all the geologic environments that are favorable for the various types of lead and zinc deposits. In general, and unless stated otherwise, only the surface and near-surface rocks within a WSA, those to depths of a few 1,000 feet, are evaluated for lead/zinc favorability. Favorable rock that may exist at greater depths within the WSA are not considered in these evaluations unless there are compelling reasons to do so.

WSAs assigned to the "f1" category are unfavorable for lead and/or zinc. None of the geologic characteristics that are normally associated with the major types of lead and/or zinc deposits can be identified within the WSA.

WSAs assigned an "f2" rating are marginally favorable for lead and/or zinc. If deposits do occur in this geologic environment, they will generally be small, less than 50,000 tons of recoverable lead or zinc or a combination of the two. In general, a WSA assigned an "f2" lead/zinc favorability will be within a lead and/or zinc province considered by most investigators to have a low resource potential. For example, the lead/zinc favorability of a WSA in which igneous activity has been minimal might be assigned an "f2" rating. An environment such as this may be favorable for only low-grade strata-bound deposits.

WSAs assigned an "f3" rating are favorable for lead and/or zinc. If deposits do occur in this geologic environment, they can be expected to contain between 50,000 and 1,000,000 tons of recoverable lead or zinc or a combination of the two. In general, a WSA assigned an "f3" lead/zinc favorability will be within a lead and/or zinc province considered by most investigators to have at least a moderate resource potential. The geologic environment of the WSA should, in many respects, be similar to the geology of the areas within the province that contain deposits of this size (regardless of the distance from the WSA). Some of the more specific characteristics, however, may be lacking.

WSAs assigned an "f4" rating are the most favorable for lead and/or zinc. If deposits do occur in this geologic environment, they can be expected to contain more than 1,000,000 tons of recoverable lead or

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zinc or a combination of the two. In general, a WSA assigned an "f4" lead/zinc favorability will be within a lead and/or zinc province considered by most investigators to have a high resource potential. The specific geologic characteristics of the WSA should be similar in almost all respects to the geology of the major lead/zinc deposits in the province, regardless of the distance between these deposits and the WSA.

Certainty

The degree of certainty that lead and/or zinc resources occur, or do not occur, in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of lead and/or zinc in the area. The following data can be used to support the various certainty levels: (1) the reported visible occurrence of lead and zinc minerals in or near the WSA; (2) active or once-productive mines, or known deposits and prospects; (3) the results of geochemical sampling of water, sediment, soil, or rock; and (4) the results of rock assays.

At the "c1" certainty level, no direct data are available to either support or refute the existence of lead and/or zinc in the WSA, regardless of the assigned lead/zinc-favorability rating. There are no surface occurrences, mines, or known deposits in the vicinity of the WSA. The rock formations underlying the WSA and throughout the province are not known to contain lead and/or zinc deposits or occurrences. The WSA will, therefore, be well outside of any generally recognized lead and/or zinc mining district. Geochemical surveys or exploration drilling are not known to have been conducted in the area.

The "c2" certainty level implies that positive data, though somewhat limited, exist in the vicinity of the WSA. At a minimum, one prospect, rock assay, or deposit is known from the area, but the extrapolation of "continuity" from this occurrence to the WSA is tenuous. The results of an initial geochemical survey can be used at this certainty level to either help support or refute the existence of lead and/or zinc within the WSA.

At the "c3" certainty level, visible occurrences of lead and/or zinc minerals, prospects, or rock assays from within or near the WSA must be verified. Generally speaking, the WSA will be within or very near an established lead- and/or zinc-mining district. A "c3" rating can also be used if the rating team consen-

sus deems that the extrapolation of nearby direct data is stronger than for a "c2" certainty.

The "c4" certainty for lead/zinc can be applied to those WSAs that lie in well established lead- and/or zinc-mining districts, providing that a mine, deposit, or significant occurrence is within or very near the WSA (and assuming, of course, that the geology of the WSA is similar to the geology of the nearby lead/zinc deposits). All things being equal, a "c4" certainty is preferred over a "c3" certainty if the geologic environment of the WSA contains abundant lead and/or zinc occurrences, prospects, and a few mines. (By definition, when a "c4" certainty is used with an "f1" favorability, it indicates with a high degree of certainty that lead and/or zinc resources do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR MANGANESE RESOURCES

Favorability

Economic manganese deposits are those that can be mined profitably now or in the near future. At current prices, economic deposits must contain between 25 and 50 percent manganese. In the United States, manganese occurs in a variety of geologic environments, but all resources are subeconomic because of either too low a grade or because the deposits contain too little manganese to be extracted economically. Although the United States has no manganese reserves, world reserves are more than adequate to meet world demand for the next several decades, providing, of course, that suppliers are willing to continue to sell these reserves.

The three chief types of manganese deposits are: (1) sedimentary deposits laid down as oxides and carbonates (includes deep-sea nodules); (2) deposits that are genetically related to volcanism; and (3) deposits related to hydrothermal activity (USDI, USGS, 1973). The conceptual boundary between these deposit types is not well defined, and it is not uncommon for one type of deposit to grade into another, especially in areas characterized by secondary and supergene enrichment. In general, deposits associated with sedimentary rocks (type [1] above) contain the bulk of the world's manganese resources, chiefly in the form of oxides.

Manganese is the twelfth most abundant element. It is most abundant in mafic igneous rocks (0.16 percent)

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where it substitutes for other elements in certain minerals rather than forming separate manganese minerals. Under weathering, the mafic minerals readily decompose, freeing manganese in its ionic form. The manganese can then be transported great distances in reducing or near-normal ground- and surface-waters and eventually deposited in oxidizing environments as manganese oxides and carbonates.

Economic manganese can occur in a variety of geologic environments, as outlined briefly above. A complete characterization of each deposit type for the favorability levels listed below (f2, f3, and f4) would therefore be lengthy. Furthermore, such detailed characterizations would probably not be of immediate use to the geologist trying to assist the land manager with a land-use decision. Thus, as a first step in determining WSA favorability for manganese, the "manganese province map" has been used (USDI, USGS, 1980e). This map, similar to other previously published mineral and metallogenic maps, illustrates favorable areas (provinces) in the conterminous U.S. for manganese deposits. USGS characterized the type and size of manganese deposits that could be anticipated within each province, as well as the overall manganese resource potential of each province (USDI, USGS, 1980e). In addition, the deposit sizes associated with the f2, f3, and f4 favorability levels are based on other USGS data (USDI, USGS, 1981).

In practice, the manganese favorability of a WSA is evaluated for each type of manganese province. These evaluations, however, can usually be done rapidly because it is very unlikely that a WSA will contain all the geologic environments that are favorable for the various types of manganese deposits. In general, and unless stated otherwise, only the surface and near-surface rocks within a WSA, those to depths of about 1,000 feet, are evaluated for manganese favorability. Favorable rocks that may exist at greater depths within the WSA are not considered in these evaluations unless there are compelling reasons to do so.

WSAs assigned to the "f1" category are unfavorable for manganese. None of the geologic characteristic that are normally associated with the major types of manganese deposits can be identified in the area being evaluated.

WSAs assigned an f2 rating are marginally favorable for manganese. If deposits do occur in this geologic environment, they will generally be small, less than 100,000 tons of 40-percent manganese. In general, a WSA assigned an f2 manganese favorability will be

within a province considered by most investigators to have a low resource potential, such as a volcanic environment capable of supporting volcanogene-type deposits.

WSAs assigned an f3 rating are moderately favorable for manganese. If deposits do occur in this geologic environment, they can be expected to contain between 100,000 and 10,000,000 tons of 40-percent manganese. In general, a WSA assigned an f3 manganese favorability will be within a manganese province considered by most investigators to have at least a moderate resource potential. The geologic environment of the WSA will be favorable chiefly for sedimentary-type deposits, and the geology of the WSA should be similar, in many respects, to the geology of areas that contain deposits of this size regardless of their distance from the WSA.

WSAs assigned an f4 rating are the most favorable for manganese. If deposits do occur in this geologic environment, they can be expected to contain more than 10,000,000 tons of 40-percent manganese. In general, a WSA assigned an f4 manganese favorability will be within a manganese province considered by most investigators to have a high resource potential. The specific geologic characteristics of the WSA should be similar in almost all respects to the geology of areas that contain deposits of this size regardless of their distance from the WSA.

Certainty

The degree of certainty that manganese occurs, or does not occur, in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of manganese in the area. The following types of data can be used to support the uncertainty levels: (1) reports of visible and significant occurrences of manganese minerals in or near the WSA; (2) active or once productive mines or known deposits and prospects; (3) the results of geochemical sampling of water, sediment, soil, or rock; and (4) the results of rock assays.

No direct data are available to either support or refute the existence of manganese in the WSA, regardless of the assigned manganese favorability rating. There are no surface occurrences, mines, or known deposits in the vicinity of the WSA. The rock formations underlying the WSA are not known to contain manganese deposits or occurrences in the geologic province containing the WSA. Geochemical surveys and/or exploration drilling are not known to have

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been conducted in the area. The WSA will, therefore, be well outside of any generally recognized manganese province.

The c2 certainty level implies that some data, though somewhat limited, exist in the vicinity of the WSA. At a minimum, one prospect, rock assays, or one deposit is known from the area, but the extrapolation of "continuity" from this occurrence to the WSA is tenuous at best. The results of an initial geochemical survey can be used at this certainty level to either help support or refute the existence of manganese within the WSA.

At the c3 certainty level, visible occurrences of manganese minerals, prospects, mines, or rock assays, must be reported from within or near the WSA. Furthermore, the WSA will be within or very near a generally recognized manganese province. A c3 rating can also be used if the rating team consensus deems that the extrapolation of nearby direct data warrants a c3 rather than a c2 rating.

The c4 certainty for manganese can be applied to those WSAs that lie in a well-established manganese-mining area, providing that a mine, deposit, or significant occurrence is within or very near the WSA (and assuming, of course, that the geology of the WSA is similar to the geology of the areas containing the manganese deposits). All things being equal, a c4 rather than a c3 rating is applied if manganese occurrences and prospects occur abundantly in the general vicinity of the WSA. (By definition, when a c4 certainty is used with an f1 favorability, it indicates with a high degree of certainty that manganese resources do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR GOLD RESOURCES

General

Gold is the principal medium of international monetary exchange. Throughout history, gold has been used in the manufacture of jewelry and related articles, and more recently, gold has been used in electronics and computer applications. The chief use for gold in the United States, however, is for arts and jewelry (USDI, USBM, 1982). The world's gold mine reserve totals about 1.2 billion troy ounces, 6 percent of which is attributed to the U.S.

Favorability

Gold is a rare element, its crustal abundance is estimated at about 1 gram per 30 metric tons of rock (0.003 - 0.004 parts per million) (USDI, USGS, 1973). In ore deposits, gold is commonly associated with pyrite and sulfide minerals of silver and copper. All gold ores contain some silver, and many ores that are predominately of silver and of copper contain appreciable quantities of gold. It is estimated that about 40 percent of domestic gold production in 1981 was recovered as a byproduct of base-metal mining, chiefly copper mining (USDI, USBM, 1982).

Gold occurs most commonly as the native metal, and rarely as a telluride. Gold deposits can generally be grouped into four types, as follows: gold-bearing quartz veins of deep and shallow origin, placer deposits (includes young and ancient placers), disseminated gold deposits, and gold produced as a byproduct of base-metal mining.

The hydrothermal quartz-vein deposits that originate at great depth consist essentially of quartz and gold that replace wallrock or fill open spaces along fractures. Most of these deposits are enclosed in Precambrian rock and are of Precambrian age (USDI, USGS, 1973). The shallow quartz-vein gold deposits are the well-known "bonanza deposits" in the western United States. Besides quartz and gold, the veins typically contain carbonate minerals, barite, fluorite, and large amounts of silver. Most of these deposits are contained in highly altered volcanic rocks of Tertiary age. These deposits usually do not extend more than a few thousand feet below the surface (usually much less) and no new discoveries have been made in the past 30 years (these deposits are among the most easily discovered gold deposits).

Identified gold-placer deposits are chiefly of Cenozoic and Precambrian age. Most commonly, the gold occurs in stream deposits and less commonly, in beach deposits. Although placer deposits may account for one-fourth to one-third of the cumulative world production of gold, most large placers in the U.S. have already been discovered and exhausted (USDI, USGS, 1973); large, uneconomic low-grade gold-placer deposits have been identified in Wyoming and California). The placers of Precambrian age, particularly those in the Witwatersrand district in South Africa, are enormously large and have produced the bulk of the world's total annual gold output for more than two decades.

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In recent years, deposits of finely disseminated gold have been discovered in Nevada and elsewhere (USDI, USGS, 1973). These deposits generally consist of very fine-grained gold disseminated in carbonate rock. The ore was formed by hydrothermal replacement of the host carbonate rock; a ton of mineralized rock contains an average of about 3 oz of gold. These deposits are poorly understood and early overlooked during mineral exploration.

As a first step in determining a WSA's favorability for gold, the "gold province map" was used (USDI, USGS, 1980f). This map, similar to previously published mineral and metallogenic maps, illustrates the most favorable areas (provinces) in the conterminous United States considered to be favorable for gold deposits. To the extent possible, USGS characterized the type and size of gold deposits that could be anticipated within each province, as well as the overall gold resource potential of each province. In addition, the deposit sizes associated with the f2, f3, and f4 favorability levels are based on other USGS data (USDI, USGS, 1981).

In practice, the gold favorability of a WSA is evaluated for each type of gold deposit, regardless of whether or not the WSA lies within a gold province. These evaluations, however, can usually be done rapidly because it is very unlikely that a WSA will contain all the geologic environments that are favorable for the various types of gold deposits. In general, and unless stated otherwise, only the surface and near-surface rocks within a WSA, those to depths of a few 1,000 feet, are evaluated for gold favorability. Favorable rock that may exist at greater depths within the WSA are not considered in these evaluations unless there are compelling reasons to do so.

WSAs assigned to the "f1" category are unfavorable for gold. None of the geologic characteristics that are normally associated with the major types of gold deposits can be identified within the WSA.

WSAs assigned an "f2" rating are marginally favorable for gold. If deposits do occur in this geologic environment, they will generally be small, less than 25 tons of gold or very finely-disseminated in stratabound deposits. In general, a WSA assigned an f2 gold favorability will be within a province considered by most investigators to have a low resource potential.

WSAs assigned an "f3" rating are favorable for gold. If deposits do occur in this geologic environment, they can be expected to contain between 25 and 500

tons of gold. In general, a WSA assigned an f3 gold favorability will be within a gold province considered by most investigators to have at least a moderate resource potential. The geologic environment of the WSA will be favorable chiefly for gold-quartz lodes, large placers, or "bonanza-type" deposits. The geology of the WSA should be similar, in many respects, to the geology of areas that contain deposits of this size, regardless of their distance from the WSA. In any case, the deposit types (models) that are applied to the WSA (i.e., porphyry copper type) must be stated clearly in the WSA report, along with the reasons for the estimated favorability.

WSAs assigned an "f4" rating are the most favorable for gold. If deposits do occur in this geologic environment, they can be expected to contain more than 500 tons of gold. In general, a WSA assigned an f4 gold favorability will be within a gold province considered by most investigators to have a high resource potential. The specific geologic characteristics of the WSA should be similar in almost all respects to the geology of areas that contain deposits of this size, regardless of their distance from the WSA.

Certainty

The degree of certainty that gold occurs, or does not occur, in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of gold in the area. The following types of data can be used to support the certainty levels: (1) reports of visible occurrences of gold in or near the WSA; (2) active or once productive mines or known deposits and prospects; (3) the results of geochemical sampling of water, sediment, soil, or rock; and (4) the results of rock assays.

At the "c1" certainty level, no direct data are available to either support or refute the existence of gold in the WSA, regardless of the assigned gold favorability rating. There are no surface occurrences, mines, or known deposits in the vicinity of the WSA. The rock formations in this province are not known to contain gold deposits or occurrences. Geochemical surveys and/or exploration drilling are not known to have been conducted in the area. The WSA will, therefore, be well outside of any generally recognized gold province.

The "c2" certainty level implies that positive data, though somewhat limited, exist in the vicinity of the WSA. At a minimum, one prospect, rock assay, or deposit is known from the area, but the extrapolation of

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"continuity" from this occurrence to the WSA is tenuous. The results of an initial geochemical survey can be used at this certainty level to either help support or refute the existence of gold within the WSA.

At the "c3" certainty level, visible occurrences of gold, prospects, mines, or rock assays must be reported from within or near the WSA. Furthermore, the WSA will be within or very near a generally recognized gold province. A c3 rating can also be used if the rating team consensus deems that the extrapolation of nearby direct data warrants a c3 rather than a c2 rating.

The "c4" certainty for gold can be applied to those WSAs that lie in well established gold mining districts, providing that a mine, deposit, or significant occurrence is within or very near the WSA (and assuming, of course, that the geology of the WSA is similar to the geology of the area containing the gold deposits). All things being equal, a c4 rather than a c3 rating is applied if gold occurrences and prospects are abundant in the general vicinity of the WSA. (By definition, when a c4 certainty is used with an f1 favorability, it indicates with a high degree of certainty that gold resources do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR SILVER RESOURCE

General

Silver has been used as a basis of monetary exchange for thousands of years. In 1981, the chief uses for silver were in photography (35 percent), electrical and electronic products (29 percent), sterlingware and electroplated ware (10 percent), bronzing alloys and solders (8 percent), and miscellaneous uses such as dentistry, medical products, bearings, and jewelry (18 percent) (USDI, USBM, 1982). The world's silver mine reserve totals about 8.5 billion troy oz, 21 percent of which is attributed to the U.S.

Favorability

Silver is a comparatively rare element, its crustal abundance is estimated to be 0.07 parts per million (USDI, USGS, 1973). Ore deposits mined primarily for silver are contained chiefly in igneous rocks of intermediate composition (andesite and diorite). However, about 55 percent of the nation's primary silver supply and most of the world's supply is derived as a byproduct and coproduct of copper, lead, and zinc

mining. The chief deposit-types from which byproduct and coproduct silver are extracted are as follows: porphyry copper deposits, copper-zinc-lead replacement deposits and vein clusters, massive sulfide deposits, and numerous other deposits related to copper, zinc, and gold.

Because the criteria used to evaluate copper, lead, zinc, and gold commodities have been described elsewhere in this appendix, the reader is referred to those sections for more information on specific types of deposits.

Ore deposits that contain silver as a major constituent include (1) epithermal veins, lodes, pipes, breccias, and disseminated deposits; (2) epithermal silver-lead-zinc and silver-copper-barite deposits; (3) mesothermal silver deposits associated with lead, zinc, and copper; (4) sandstone silver deposits; and (5) sea-floor muds and hot-spring deposits (USDI, USGS, 1973). Except for a few major districts, these types of silver deposits were largely exhausted in the 19th century.

Because of the close association of silver with ores of copper, lead, zinc, and gold, the preliminary silver favorability of a WSA is estimated from mineral resources province maps published in 1980 by the USGS for copper, lead, zinc, and gold (USDI, USGS, 1980b, c, d, and f). These maps, similar to previously published mineral and metallogenic maps, illustrate the most favorable areas (provinces) in the conterminous U.S. considered to be favorable for copper, lead, zinc, and gold. To the extent possible, USGS characterized the type and size of deposits that could be anticipated within each province, as well as the overall potential of each resource. The favorability categories listed below for silver are, therefore, based partly on this work. The silver-deposit sizes associated with the f2, f3, and f4 favorability levels are based on other USGS data (USDI, USGS, 1981).

WSAs assigned to the "f1" category are unfavorable for silver. None of the geologic characteristics that are normally associated with the major types of silver deposits can be identified within the WSA.

WSAs assigned an "f2" rating are marginally favorable for silver. If deposits exist in this geologic environment, they will generally be small, less than 500 tons of silver. In general, a WSA assigned an f2 silver favorability will be within a geologic environment containing few igneous rocks, and the favorability will be related chiefly to sandstone-type silver

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deposits, or silver associated with small igneous veins.

WSAs assigned an "f3" rating are favorable for silver. If deposits exist in this geologic environment, they can be expected to contain between 500 and 10,000 tons of silver. The geologic environment of the WSA should, in many respects, be similar to the geology of areas that contain deposits of this size, regardless of the distance from the WSA. Some of the specific geologic characteristics, however, may be lacking. In any case, the deposit types (models) that are applied to the WSA must be stated clearly in the WSA report, along with the reasons for the estimated favorability.

WSAs assigned an "f4" rating are the most favorable for silver. If deposits do occur in this geologic environment, they can be expected to contain more than 10,000 tons of silver. In general, a WSA assigned an f4 silver favorability will be within a silver province considered by most investigators to have a high resource potential. The specific geologic characteristics of the WSA should be similar in almost all respects to the geology of areas that contain deposits of this size, regardless of the distance separating these deposits from the WSA.

Certainty

The degree of certainty that silver occurs, or does not occur, in a WSA is based on the proximity, type, and abundance of direct evidence that either supports or refutes the existence of silver in the area. The following types of data can be used to support the certainty levels: (1) reports of visible occurrences of silver or silver-bearing minerals in or near the WSA; (2) active or once productive mines or known deposits and prospects; (3) the results of geochemical sampling of water, sediment, soil, or rock; and (4) the results of rock assays.

At the "c1" certainty level, no direct data are available to either support or refute the existence of silver in the WSA, regardless of the assigned silver favorability rating. There are no surface occurrences, mines, or known deposits in the vicinity of the WSA. The rocks underlying the WSA and throughout the province are not known to contain silver deposits or occurrences. Geochemical surveys and/or exploration drilling are not known to have been conducted in the area. The WSA will therefore be well outside of any generally recognized silver mining district.

The "c2" certainty level implies that positive data, though somewhat limited, exist in the vicinity of the WSA. At a minimum, one prospect, rock assay, or deposit is known from the area, but the extrapolation of "continuity" from this occurrence to the WSA is tenuous. The results of an initial geochemical survey can be used at this certainty level to either help support or refute the existence of silver within the WSA.

At the "c3" certainty level, visible occurrences of silver or silver-bearing minerals, prospects, mines, or rock assays must be reported from within or near the WSA. In general, the WSA will be within or very near an established silver-mining district (or related mining district). A c3 rating can also be used if the rating team consensus deems that the extrapolation of nearby direct data warrants a c3 rather than a c2 rating.

The "c4" certainty for silver can be applied to those WSAs that lie in well-established silver-mining districts (or related mining districts), providing that a mine, deposit, or significant occurrence is within or very near the WSA (and assuming, of course, that the geology of the WSA is similar to the geology of the areas containing the silver or related deposits). All things being equal, a c4 rather than a c3 rating is applied if silver occurrences and prospects are abundant in the general vicinity of the WSA. (By definition, when a c4 certainty is used with an f1 favorability, it indicates with a high-degree of certainty that silver resources do not underlie the WSA.)

SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR GEOTHERMAL RESOURCES

Favorability

Most investigators consider recent crustal instability, high heat-flow, and young igneous rocks as favorable criteria for geothermal resources of commercial proportions. In contrast, low-temperature hydrothermal resources occur widely and have apparently originated from deep ground-water circulation in regions with normal, or slightly higher-than-normal, geothermal gradients. Because of the widespread occurrence of low-temperature geothermal resources, land withdrawals for wilderness will generally have little or no impact on the availability and use of this particular resource. Moderate- and high-temperature resources, on the other hand, occur much less frequently and are therefore considered to be more important by the ORNL/SAI evaluation group from the standpoint of potential land withdrawals. Therefore, in the

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criteria below, "low favorabilities" correspond to geologic environments favorable for low-temperature geothermal resources, whereas "high favorabilities" correspond to geologic environments favorable for high-temperature geothermal resources. In general, the favorability of a region for geothermal resources depends on: (1) the type, extent, and age of igneous activity; (2) the degree of recent tectonism; (3) the region's heat flow and geothermal gradient; and (4) geochemical and some geophysical data that reflect the presence and composition of fluid systems normally associated with elevated temperatures.

Tracts designated as having the lowest favorability, "f1," for geothermal resources will generally be within a geologic environment that lacks igneous rocks younger than Tertiary age, has minimal seismic activity, contains geologic structures which originated largely in pre-Tertiary time, and is characterized throughout the region by a very low heat-flow (less than 1.5 heat flow units), and a shallow geothermal gradient (less than 25 degrees C per kilometer).

The geologic environment of a tract rated at the "f2" level for geothermal resources is considered to be favorable for low-temperature geothermal resources (less than 90 degrees C at depths generally less than 1 kilometer). These environments are likely to contain widespread occurrences of lower- and middle-Tertiary igneous rocks, widespread Paleozoic deformation, minor seismic activity, low heatflow (between 1.5 and 2.0 heatflow units) and average geothermal gradients (25-30 degrees C per kilometer). In all likelihood, most thermal waters in an f2 environment will be of meteoric origin rather than of magmatic origin.

A tract considered favorable for geothermal resources at the "f3" level must have a potential for moderate-temperature resources (between 90 and 150 degrees C at depths generally less than 1 kilometer). The geologic environment of such a tract will generally contain widespread middle- and upper-Tertiary igneous rocks, evidence of Paleozoic and/or Mesozoic deformation, moderate seismic activity, moderate heatflow (2.0 to 2.5 heatflow units), and above-average geothermal gradients (30 to 45 degrees C per kilometer).

A tract designated "f4" must have the potential to contain high-temperature geothermal resources (more than 150 degrees C). The geologic environment of such a tract will generally contain young volcanic and igneous intrusive rocks of silicic composition

(less than 1 million years old), evidence of late-Cenozoic tectonism, moderate to intense seismic activity, high heatflow (more than 2.5 heatflow units), and steep geothermal gradients (more than 45 degrees C per kilometer).

Certainty

The certainty of occurrence of geothermal resources within a tract is based on the amount and proximity of direct evidence of resource occurrence, such as hot springs and their deposits, thermal wells, and geophysical methods that directly measure the temperature of geothermal systems.

In the lowest certainty level, "c1," no direct data are available to either support or refute the existence of the resource within the tract, regardless of the level of geologic favorability. Hot springs, thermal wells, and any other indicators of resources present are not known from the region surrounding the tract.

The "c2" certainty level also indicates that no direct data are available to support or refute the existence of the resource within the tract being evaluated. However, direct evidence of resource occurrence must be nearby, and such that extrapolation of resource occurrence to the tract can be made with a moderate degree of confidence (certainty).

The "c3" level of certainty requires the identification of at least one thermal spring or well within or very near the tract being evaluated. Areas identified as "Potential Geothermal Resource Areas" by State or Federal agencies, however, can usually be assigned to this certainty level. Moreover, a "c3" rating can be used if the rating team consensus deems that nearby direct data for resource occurrence more closely support a "c3," rather than "c2," rating.

The highest level of certainty for geothermal resources, "c4," is used only when the tract lies within an area of abundant hot springs and/or thermal wells. Moreover, the tract may lie within or very near to a "Known Geothermal Resource Area" as identified by Federal agencies.

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SPECIFIC CRITERIA USED TO DERIVE LEVELS OF FAVORABILITY AND CERTAINTY FOR HYDROPOWER RESOURCES

General

Hydropower resources are more related to the hydrologic and topographic environments, rather than to the geologic environment (except to the extent that the geology influences the topography which then can influence the climate). Because of this distinction, the favorability of the environment for hydropower resources is rated in terms of the hydrologic environment, not the geologic environment as is done with other mineral resources. The favorability for other uses of surface water, such as irrigation and industrial purposes, is not considered in this resource evaluation.

The distinction between the favorability of a tract's hydrologic environment, and the degree of certainty that the resource does, or does not, exist within the tract can be ambiguous for hydropower resources. This is because hydropower, unlike the other mineral resources, exists only at the surface.

For example, a tract that contains a small perennial stream may be favorable for a small-scale hydroelectric development, and at the same time the certainty that the water occurs is obviously high. On the other hand, tracts that do not contain streams are, with a high degree of certainty, very unfavorable for hydropower resources.

Based on the discussion above, a 4-part subdivision of "certainty" as used for the other mineral resources is not readily applicable to hydropower resources. Therefore, the certainty of occurrence of hydroelectric resources is based on a 2-part subdivision, as follows: (1) c1: data are not available to estimate the certainty of occurrence; and (2) c4: data indicate with a high degree of certainty that a resource does, or does not, occur within the tract.

The favorability of the hydrologic environment is based on: (1) the size (measured in discharge of cubic feet of water per second) of streams within the tract; (2) the climate of the area as one measure of the probable maximum and minimum flow rates of streams within the tract; (3) the topography; and, when information is available, (4) the gross theoretical power at potential hydroelectric sites (these estimates are assigned only to those sites that have been evaluated by either the Army Corps of Engineers, the

Water Power and Resources Administration, the Federal Energy Regulatory Commission, or the USGS). If no data are obtainable from these sources, the hydroelectric resource favorability is judged from the available general knowledge of the geology, topography, and climatic conditions of the region wherein the tract lies.

Favorability

The tract has annual precipitation and essentially no surface runoff, except during short, infrequent periods of heavy rainfall. Thus, there is little or no favorability for the development of hydropower resources.

The tract is estimated to have a potential only for the development of "small-scale" (0.05 to 15 megawatts) hydroelectric capacity. The tract should contain one or more small perennial streams.

The tract is estimated to have a potential for "moderately-large" (15 to 25 megawatts) hydroelectric capacity. Relatively large streams should flow through the tract, and the topography and geology should be such that construction of a dam is feasible.

The tract is estimated to have a potential for "large-scale" (in excess of 25 megawatts) hydroelectric capacity. A major river must flow through the tract, or the tract must be located below maximum-pool level of the potential reservoir site.

Certainty

No data or very few data are available to determine whether or not sufficient streamflow occurs in the tract to characterize its hydropower potential.

Perennial streams are known to exist in the tract; or, if used with a favorability of f1, streams are known not to exist within the tract.

APPENDIX 6

MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

In response to comments received on the Draft EIS relative to the feasibility of potential mineral development, mineral data presented in that document have been reviewed by a team of BLM geologists. The geologists reviewed the original SAI ratings for each WSA and modified those ratings where additional data indicated that a modification was justified. Information compiled by BLM, other Federal agencies, and private industry since the original SAI study was completed has been factored into the individual WSA ratings. In some instances, this new data raised the favorability and certainty of minerals occurring in individual WSAs, while, at the same time, it raised the certainty that certain minerals do not occur in other WSAs. The original SAI rating system is detailed in Appendix 5.

Concurrent with the review and updating of the favorability/certainty ratings for each WSA, a separate study was conducted to project the anticipated demand for mineral commodities known to occur in the WSAs for the foreseeable future. Once the updated ratings for minerals in the individual WSAs were completed, the ratings were tabulated on a Statewide basis. These tabulations, along with the demand projections for each commodity, were combined to make determinations as to where mineral and energy resources would most likely be developed. For some mineral commodities, particularly the locatable minerals, projections were made for both exploration and possible development of the mineral resource.

Exploration and development projections were made assuming that there would be no wilderness designation and no Interim Management Policy which would restrict exploration or development. The projections also assume that the lands would continue to be open for the location of mining claims and that BLM would process mineral lease applications. It is noted that many WSAs in the State are known to contain mineral resources which will not likely be developed in the foreseeable future. The importance of these mineral resources is not diminished however, and these resources may be the focus of exploration and development as existing deposits are depleted or as market conditions warrant.

Several WSAs contain strategic and critical materials. These are listed in Table 6.1 along with the WSAs

in which they are projected to occur. Many of these are of low quality and quantity and are not projected for any exploration or development.

The following is a compilation of the development potential, by commodity, for the lands currently included in WSAs throughout the State of Utah.

Disseminated Gold

Since 1980, there has been a world-wide increase in gold exploration and mining. This increase accelerated rapidly in 1985 and 1986, and it is expected that the market demand will continue to outpace production over the next several years.

The United States ranks second in gold production behind the Republic of South Africa. In 1986, the largest gold producing states were Nevada, South Dakota, California, and Montana. Over 40 new mines were opened in 1986, and approximately 80 percent of all mineral exploration spending in the United States is now devoted to gold.

Many of the new gold mines in the Great Basin are open pit operations in disseminated gold deposits (deposits in which fine gold is disseminated in carbonate rocks). The gold particles range in size from 10 to 0.5 microns and commonly grade from 0.03 to 0.30 ounces per ton. The majority of this fine gold is recovered in cyanide heap leaching processes, although other recovery processes, including carbon-in-leach processes, are being developed.

A disseminated gold deposit is known to occur in the north end of the Swasey Mountain WSA. Several companies have done initial exploration in the area, but extensive exploration has been inhibited by the wilderness study status of the area. It is projected that this deposit will be further delineated and developed in the future.

Magnetic surveys recently completed in the Great Basin have delineated other areas with disseminated gold potential. Two of these areas, the north end of the Deep Creek Mountains and the north end of the Fish Springs Range, are adjacent to or within WSAs. Further exploration is projected for these areas in the foreseeable future.

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Table 6.1
Strategic and Critical Materials in the WSAs^a

WSA Name	Strategic or Critical Material
North Stansbury Mountains	Lead, silver, zinc, and copper
Cedar Mountains	Silver and copper
Deep Creek Mountains	Beryllium, lead, silver, tungsten, zinc, molybdenum, mercury, and copper
Fish Springs	Beryllium, lead, tungsten, and zinc
Rockwell	Beryllium, lead, tungsten, and zinc
Swasey Mountain	Beryllium, lead, silver, zinc, molybdenum, and copper
Howell Peak	Beryllium, lead, tungsten, and zinc
Conger Mountain	Beryllium, lead, tungsten, and zinc
Notch Peak	Beryllium, lead, silver, tungsten, zinc, molybdenum, platinum, and copper
King Top	Beryllium, lead, tungsten, and zinc
Wah Wah Mountains	Beryllium, lead, tungsten, and zinc
Cougar Canyon	None
Red Mountain	None
Cottonwood Canyon	Silver
LaVerkin Canyon	None
Deep Creek	None
North Fork Virgin River	None
Orderville Canyon	None
Parunuweap Canyon	None
Canaan Mountain	None
Moquith Mountain	None
The Blues	None
Mud Spring Canyon	None
Paria-Hackberry	None
The Cockscomb	Copper
Wahweap	None
Burning Hills	Titanium
Death Ridge	Titanium
Phipps Death Hollow	None
Steep Creek	Copper
North Escalante Canyons	Copper
Carcass Canyon	Titanium
Scorpion	None
Escalante Canyons Tract 5	None
Fifty Mile Mountain	Titanium
Red Butte	None
Spring Creek Canyon	None
The Watchman	None
Taylor Creek Canyon	None
Goose Creek Canyon	None
Beartrap Canyon	None
Mt. Ellen-Blue Hills	Silver and copper
Bull Mountain	Silver and copper
Dirty Devil	Silver and copper

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

Table 6.1 (continued)
Strategic and Critical Materials In the WSAs^a

WSA Name	Strategic or Critical Material
Horseshoe Canyon (South)	Copper
French Spring-Happy Canyon	Copper
Fiddler Butte	Silver and copper
Mt. Pennell	Silver and copper
Mt. Hillers	Silver and copper
Little Rockies	Silver, cobalt, nickel, and copper
Fremont Gorge	None
Mancos Mesa	Vanadium and copper
Grand Gulch Complex	None
Road Canyon	None
Fish Spring Canyon	None
Mule Canyon	None
Cheesebox Canyon	None
Dark Canyon Complex	Vanadium
Butler Wash	None
Bridger Jack Mesa	Vanadium
Indian Creek	Vanadium and copper
Behind The Rocks	Vanadium and copper
Mill Creek Canyon	Manganese, vanadium, and copper
Negro Bill Canyon	Manganese, vanadium, and copper
Horseshoe Canyon (North)	Manganese, vanadium, and copper
Lost Spring Canyon	Vanadium and copper
South Needles	None
San Rafael Reef	Manganese, vanadium, and copper
Crack Canyon	Manganese, vanadium, and copper
Muddy Creek	Manganese, vanadium, and copper
Devils Canyon	Manganese and vanadium
Sids Mountain	Manganese, vanadium, and copper
Mexican Mountain	Manganese, vanadium, and copper
Jack Canyon	None
Desolation Canyon	None
Turtle Canyon	None
Floy Canyon	Vanadium
Coal Canyon	None
Spruce Canyon	Vanadium
Flume Canyon	Vanadium
Westwater Canyon	Manganese
Winter Ridgea	Manganese
Daniels Canyon	Manganese

Source: BLM File Data.

^aThese WSAs are known to or likely to contain deposits of the strategic or critical material listed. Many of these deposits are not well enough known to project exploration or development in either the short-term or long-term future.

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

Copper - Silver - Gold

Small scale copper and silver development will occur in the foreseeable future in the Little Rockies WSA in association with uranium development.

Further exploration for copper and vein type silver/gold will occur in the following WSAs:

1. North Stansbury Mountain
3. Deep Creek Mountains
42. Mt. Pennel
43. Mt. Hillers

Oil Shale/Tar Sand

The Department of Energy's Energy Information Administration projects that, at least through 1995, neither the oil shale or tar sand resource will contribute to the nation's overall energy picture because of lower prices for conventional fuels. Several WSAs in the Book Cliffs area contain thin, low grade oil shale deposits for which development is not projected in the foreseeable future. Only the Winter Ridge WSA contains oil shale that could be developed given favorable economic conditions; however, this is not projected to occur in the foreseeable future.

The Winter Ridge WSA also has potential for development of an underlying tar sand resource. Oil and gas leases in the WSA have not been converted to combined hydrocarbon leases although three applications are currently pending.

The tar sand resource is recoverable by surface and in-situ mining methods; however, because of the vast tar sand resource (PR Spring STSA) that is found in the area outside of the WSA, it is not anticipated that the deposits in the WSA will be developed in the short-term future. It could, however, be developed over the long term.

Substantial tar sand resources are also known to underlie WSAs in the Tar Sand Triangle (Tar Sand Triangle STSA) adjacent to the Glen Canyon NRA, particularly the French Spring/Happy Canyon and Fiddler Butte WSAs. In order to assure maximum recovery of this resource and to justify the costs associated with the development in the area, the entire deposit would need to be systematically developed, including the portion located in the Glen Canyon NRA. The Department of the Interior has not yet converted existing oil and gas leases in the Tar Sand Triangle to combined hydro-

carbon leases. Because of this fact and potential significant environmental problems associated with development of the tar and sand resource in and adjacent to the recreation area, no development is projected in the short-term future. However, the Tar Sand Triangle will eventually be a major source of hydrocarbon production when the price of oil rises to a level that makes the recovery of oil from tar sand profitable and if environmental concerns can be mitigated.

Several WSAs contain marginal deposits of tar sand located in STSAs which are not projected to be developed in the foreseeable future. These WSAs and the STSAs involved are:

CIRCLE CLIFFS STSA

31. North Escalante Canyons/The Gulch

SAN RAFAEL SWELL STSA

59. San Rafael Reef
60. Crack Canyon
62. Devils Canyon
63. Sids Mountain
64. Mexican Mountain

SUNNYSIDE STSA

65. Jack Canyon
66. Desolation Canyon

PR SPRING STSA

71. Flume Canyon

Oil and Gas

According to information published by the Department of Energy, total primary energy consumption is projected to increase at an average rate of 1.5 to 2 percent per year through the year 2000. Those energy projections indicate a continued decline in relative importance for oil as an energy source. Oil's contribution has decreased from just over 50 percent of the total in 1980 to about 46 percent in 1985. By the year 2000, oil's share is projected to range between 38 to 41 percent (USDOE, 1986).

In contrast to oil, the importance of natural gas is projected to increase from 18.5 percent of total energy consumption in 1985 to 21 percent by the year 2000.

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

Over the last several decades, the United States has increasingly relied on oil imports to meet its growing demand. In 1988, the United States again approached the point where nearly 40 percent of the oil consumed by the nation was imported. On the other hand, the nation has historically been almost self-sufficient in natural gas supply, importing only small quantities from Canada. As known domestic reserves of both oil and gas are depleted, industry will intensify the search for new reserves within the United States. The Federal lands in the western United States will continue to be one of the prime areas of interest because of the large untested areas that underlie these Federal lands. Because of their very nature, the lands currently studied for wilderness make up a considerable percentage of these untested lands.

WSAs with favorabilities of f2 through f4 and certainties of c3 and c4 have been identified as areas where exploration drilling and development activities are most likely to occur in the foreseeable future. These WSAs are believed to be underlain by favorable rock units or structures for hydrocarbon accumulation. The WSAs with projected development are:

- 29. Phipps-Death Hollow (CO₂)
- 55. Behind the Rocks
- 65. Jack Canyon
- 66. Desolation Canyon
- 67. Turtle Canyon
- 68. Floy Canyon
- 69. Coal Canyon
- 70. Spruce Canyon
- 71. Flume Canyon
- 73. Winter Ridge

Several other WSAs are also thought to be underlain by favorable rock units or structures for hydrocarbon accumulation; however, the certainty that these conditions exist for such accumulation is not as high as for the WSAs listed above. However, it is projected that exploration drilling will occur in these areas in the foreseeable future:

- 8. Conger Mountain
- 22. The Blues
- 31. North Escalante Canyons/The Gulch
- 39. Horseshoe Canyon (South)
- 45. Mancos Mesa
- 46. Grand Gulch
- 47. Road Canyon
- 48. Fish Creek Canyon

- 49. Mule Canyon
- 54. Indian Creek
- 56. Mill Creek Canyon
- 57. Negro Bill Canyon
- 58. Horseshoe Canyon (North)
- 64. Mexican Mountain
- B. Spring Creek Canyon
- H. Lost Spring Canyon

Coal

Coal production on Federal lands in the United States totaled 187,100,000 tons in 1988. Of that total, Utah produced 15.36 million tons (USDI, BLM, 1989). According to the Department of Energy's Energy Information Administration, coal consumption in the U.S. by the year 2000 is expected to be between 1,086 and 1,126 million tons. The future demand for Utah coal is tied to electrical generation in Utah and in the states west to the Pacific Coast, and potentially the Pacific Rim nations. The major disadvantage for Utah coal is that all current production has and will likely continue to come from underground mines and cannot compete with Montana and Wyoming surface mined coal for markets in the midwest. The single exception would be possible surface mining operations in the Henry Mountain coal field in the vicinity of the Mt. Ellen-Blue Hills WSA. Passage of acid rain legislation by the Congress could enhance the market for Utah's low sulfur coal.

To date, the major production of coal in Utah has come from the Wasatch Plateau, Book Cliffs, and Emery coal fields in Carbon, Emery, and Sevier Counties. It appears that the coal located in the WSAs in the Book Cliffs area is too thin to be mined in the foreseeable future. In addition, better quality and more accessible coal lies outside the WSAs. Although the Henry Mountain coal field contains the only substantial surface mineable coal in Utah, a major portion of the field will not be developed because of environmental concerns related to adjacent Capital Reef National Park and a free roaming bison herd. Current land use planning does provide for possible coal development (surface mine methods) in the Wildcat Mesa area. No development is projected in this area in the short-term future.

The WSAs on the Kaiparowits Plateau contain a substantial underground mineable coal resource that will become increasingly valuable as the Emery and Wasatch Plateau coal reserves are depleted. The Kaiparowits Plateau could be a major source of coal for

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

future power generating plants in the southwest. Projections made for the Uintah-Southwestern Utah Coal Region do not, however, assume any production from the Kaiparowits region through the year 2005. As a result, many existing leases on the Kaiparowits Plateau will likely be lost because of failure to meet the diligence requirements contained in the leases. Future land management planning updates will determine which lands would then be suitable for future leasing consideration. Substantial development of the coal reserves in the WSAs on the Kaiparowits Plateau is probably at least 30 to 40 years in the future.

It is noted that a small coal mining proposal is being planned for a site located between the Wahweap and Burning Hills WSAs. This project, known as the Smoky Hollow Mine, would extract 0.5 to 2 million tons of coal per year. The coal could be hauled by truck to Moapa and Flagstaff for transfer to rail cars. The project sponsors plan for mining to begin in the mid-1990s (Andales, 1989 and UDNRE, UEO, 1988)

The following WSAs contain coal which could be developed in the long term:

- 22. The Blues
- 23. Mud Spring Canyon
- 26. Wahweap
- 27. Burning Hills
- 28. Death Ridge
- 32. Carcass Canyon
- 35. Fifty Mile Mountain
- 36. Mt. Ellen-Blue Hills
- 66. Desolation Canyon
- 67. Turtle Canyon

Uranium/Vanadium

According to the Department of Energy's Energy Information Administration, nuclear power is projected to be the fastest growing source of energy between 1985 and 2000, despite accidents at Three Mile Island and Chernobyl. However, despite its rapid rate of growth, it is still expected to contribute a relatively small share of total energy consumption. In the year 2000, nuclear power is projected to account for between 8.0 and 9.3 percent of total energy consumption, compared to 6.3 percent in 1985. The United States, France, and Japan are projected to account for between 56 and 65 percent of the projected increase in nuclear power consumption (USDOE, 1986).

The domestic uranium industry has been impacted dramatically over the past several years by nuclear accidents at Three Mile Island and Chernobyl which have put many nuclear generating facilities on hold, thus reducing the demand for uranium. In addition, imported uranium has been purchased and enriched by the Department of Energy for domestic use. A recent 10th Circuit Court decision ruled that the Department of Energy is mandated under the 1954 Atomic Energy Act to ensure the viability of the domestic uranium industry. If the U.S. Supreme Court upholds this decision, it will undoubtedly enhance the future of the uranium industry in Utah.

WSAs containing uranium resources with favorability and certainty ratings of 3 and 4 will likely be developed in the foreseeable future. These include:

- 43. Mt. Hillers
- 44. Little Rockies
- 53. Bridger Jack Mesa
- 58. Horseshoe Canyon (North)
- 59. San Rafael Reef
- 60. Crack Canyon
- 61. Muddy Creek
- 63. Sids Mountain
- 64. Mexican Mountain

In addition to the WSAs listed above where development is likely to occur, the following WSAs contain uranium resources with lower favorability and certainty ratings. It is projected that as the price and demand for uranium increases, exploration to further delineate the existence of the uranium resource will occur in the following WSAs:

- 14. Cottonwood Canyon
- 30. Steep Creek
- 31. North Escalante Canyons/The Gulch
- 32. Carcass Canyon
- 35. Fifty Mile Mountain
- 38. Dirty Devil
- 40. French Spring-Happy Canyon
- 41. Fiddler Butte
- 45. Mancos Mesa
- 55. Behind the Rocks

Mineral and Energy Commodities Which Are Not Projected To Be Developed In The Foreseeable Future

The following mineral commodities are not projected to be extracted from WSA lands within the State of Utah in the foreseeable future:

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

Potash

Although the Paradox Member of the Hermosa Formation is known to underlie 14 WSAs in the State, no development is anticipated because of the depth of the deposits (greater than 4,000 feet) and the potash availability in other parts of the United States. Small scale solution mining will continue in the Paradox Basin outside the WSAs, however, the greatest percentage of United States production will continue to come from underground mining in the Carlsbad area of southeastern New Mexico.

Phosphate

Phosphate is known to underlie a portion of the Cedar Mountain WSA at depths that would require underground mining. The extensive surface mineable deposits in Florida and southeastern Idaho will continue to be developed and will preclude development of the Cedar Mountain deposits in the next half century.

Tungsten

Small tungsten deposits are known to or likely to occur in eight WSAs including the Deep Creek Mountains and Notch Peak. A small deposit containing 775 tons of 0.51 percent tungsten is located in the northeast part of the Notch Peak WSA. Because of the low grade and small size of the deposits, they will not be developed in the foreseeable future.

Geothermal

Although geothermal potential was indicated in the vicinity of the Fish Springs, Rockwell, and Notch Peak WSAs, there is no development potential projected from within the WSAs.

Lead, Zinc, Manganese, Platinum, Cobalt, Nickel, Beryllium, Mercury, Molybdenum, Gypsum

Although these minerals are known to occur in several WSAs, no areas were identified which have high enough favorability and certainty levels to indicate that development will occur in the foreseeable future.

Titanium

For many years, titanium has been used primarily as a source for paint pigments. More recently, however, titanium metal has been important in the defense and aerospace industries owing to its high strength-to-

weight ratio and its resistance to corrosion. More than 90 percent of the world's titanium is produced in Australia, Sierra Leone, and the Republic of South Africa. In 1986, titanium sponge metal was produced in the United States by four firms in Nevada, Ohio, Oregon, and Washington.

Large deposits of titanium ore have not been reported in Utah. Sedimentary deposits of titanium-bearing black sandstones do occur as shoreline deposits in the Straight Cliffs Formation and the Mancos Shale in south-central Utah. All of the deposits discovered to date contain only small tonnage of titanium. Such deposits are known to occur in the Burning Hills, Death Ridge, Carcass Canyon, and Fifty Mile Mountain WSAs.

The USBM investigated the worldwide availability of titanium minerals and classified the minerals and deposits as to their future development potential.

Many titanium resources in the United States were not included in the evaluation because the deposits are too small, the resource is not extractable with today's technology, or the resource is not at a demonstrated level. The titaniferous cretaceous shoreline sandstones of Utah and other states were studied by the USBM some years ago. As a result of those studies, the USBM concluded that the resources were small and that the technology to recover the resources is unproven (USDI, USBM, 1985b). As a result, it is doubtful that the titanium sands in Utah WSAs will be developed in the foreseeable future. It is anticipated, however, that if mining claims have been filed on the deposits, assessment work will continue to be performed on the claims.

Hydroelectric

Proposals to develop hydroelectric dams have been considered for up to four WSAs, Parunuweap, Desolation Canyon, Horseshoe Canyon (North), and Dirty Devil. Several other WSAs, such as Westwater Canyon, also have potential for hydroelectric development. However, BLM does not project that any development will occur within the foreseeable future due mainly to the presence of several potential sites not affected by WSAs (UDNRE, UEO, 1980; U.S. Army Corps of Engineers, 1979). Environmental concerns, such as the presence of endangered species, would likely preclude development in most of the areas under consideration in or near the WSAs. Other concerns involving WSAs include public demand,

APPENDIX 6: MINERAL AND ENERGY RESOURCE EXPLORATION AND DEVELOPMENT PROJECTIONS BY MINERAL COMMODITY

economic feasibility State water rights, and proximity of national parks to affected streams.

DEFINITION OF THE TERM	
Visual Quality	Visual Quality is defined as the degree to which a person can see or observe a landscape or object. It is a subjective term that varies from person to person. Visual quality is affected by factors such as distance, weather, and the observer's position. Visual quality is a key component of the Visual Resource Management (VRM) system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the National Environmental Policy Act (NEPA) process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
MAGNITUDE OF MAN-MADE CONTRAST	
Low Contrast	Low Contrast is defined as a contrast that is less than 10% of the background. Low contrast is typically found in areas that are not directly adjacent to the project. Low contrast is a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
Medium Contrast	Medium Contrast is defined as a contrast that is between 10% and 20% of the background. Medium contrast is typically found in areas that are directly adjacent to the project. Medium contrast is a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
High Contrast	High Contrast is defined as a contrast that is greater than 20% of the background. High contrast is typically found in areas that are directly adjacent to the project. High contrast is a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
SCENIC QUALITY	
Class I	Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class I areas are typically found in areas that are directly adjacent to the project. Class I areas are a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
Class II	Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class II areas are typically found in areas that are directly adjacent to the project. Class II areas are a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.
Class III	Class III areas are those areas that are of moderate scenic, scientific, or historic interest. Class III areas are typically found in areas that are directly adjacent to the project. Class III areas are a key component of the VRM system, which is used to evaluate and manage the visual impacts of proposed projects. The VRM system consists of three classes of areas: Class I, Class II, and Class III. Class I areas are those areas that are of exceptional scenic, scientific, or historic interest. Class II areas are those areas that are of significant scenic, scientific, or historic interest. Class III areas are those areas that are of moderate scenic, scientific, or historic interest. The VRM system is used to evaluate the potential for visual impacts from proposed projects and to develop measures to avoid, minimize, or compensate for those impacts. The VRM system is a key component of the NEPA process, which requires federal agencies to evaluate the potential for impacts from proposed projects on the environment.

APPENDIX 7

VISUAL RESOURCE MANAGEMENT RATING SYSTEM

OBJECTIVES OF VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS

The BLM and Forest Service (FS) use scenic quality, sensitivity, and visual distance criteria to determine Visual Resource Management (VRM) objectives for public lands under their respective jurisdictions. VRM terminology differs between the two agencies, but management objectives are similar, as outlined in Table 7.1.

DEFINITION OF VRM TERM

Visual Zones

Foreground-Middleground: An area that can be seen from travel routes or use areas for a distance of 3 to 5 miles. Management activities can be seen in detail. The outer boundary of this zone is defined as the point where texture and form of individual plants is no longer apparent in the landscape.

Background: The remaining area that can be seen, within about 15 miles, from travel routes or use areas. Vegetation can be discerned at least as patterns of light and dark.

Seldom Seen: Areas that are beyond the background zone or cannot be seen from travel routes or use areas, or can be seen from low use transportation routes only.

Scenic Quality

Class A: Areas in which landform, water form, and vegetation patterns are of unusual or outstanding visual quality.

Class B: Areas in which features contain variety, but are not outstanding. Areas lack dominating features.

Class C: Areas in which features have little variety and become monotonous.

Sensitivity Levels

Criteria weighed for determining visual sensitivity includes existing and proposed land uses, use levels, community attitudes, and agency attitudes.

High Sensitivity: Public concern for quality of the visual resource is major.

Medium Sensitivity: Public concern for quality of the visual resource is secondary.

Low Sensitivity: Public concern for quality of the visual resource is minor.

Magnitude of Man-Made Contrast

Low: Contrast will not attract attention from the landscape character.

Medium: Contrast attracts attention and begins to dominate the landscape character.

High: Contrast demands attention, will not be overlooked, and dominates the landscape character.

Table 7.1
Visual Management Objectives

Forest Service Terminology	BLM Terminology	Management Objective
Preservation	Class I	This class allows for natural ecological changes only.
Retention	Class II	Changes in any of the basic landscape elements should not be evident in the management activity.
Partial Retention	Class III	Changes in basic elements may be evident in the management activity. However, modifications should remain subordinate to the landscape character.
Modification-Maximum Modification	Class IV	Changes may subordinate the landscape character, but must reflect what could be natural occurrence in the characteristic area.

Source: BLM File Data.

APPENDIX 8

BLM MOU 8100/UT933/89004

CULTURAL RESOURCES
MEMORANDUM OF UNDERSTANDING
UTAH STATEWIDE WILDERNESS ENVIRONMENTAL IMPACT STATEMENT
BETWEEN
THE UTAH STATE BUREAU OF LAND MANAGEMENT
AND
THE UTAH STATE HISTORIC PRESERVATION OFFICE

I. PURPOSE

The Bureau of Land Management, hereinafter referred to as the Bureau, is preparing the Utah Statewide Wilderness Environmental Impact Statement (Wilderness EIS) under the provisions of the National Environmental Policy Act of 1969. Cultural values would not be affected by actions proposed in the Wilderness EIS.

The Bureau has the responsibility to protect historic properties (eligible for or listed on the National Register of Historic Places) on land administered by the Bureau. The Utah State Historic Preservation Office, hereinafter referred to as the State, consults with the Bureau when identifying historic properties, evaluating them for National Register inclusion, assessing effects upon them, and considering alternatives to avoid or reduce those effects. The Bureau has entered into this Memorandum of Understanding with the State to document the determination of "No Effect" to historic properties resulting from actions proposed in the Wilderness EIS.

II. AUTHORITY

This MOU is authorized under the Federal Land Policy and Management Act of 1976 and the National Historic Preservation Act of 1966, as amended. It is in accord with bureau policies and programs.

III. PROCEDURES

The Bureau will ensure that the following measures are carried out:

- A. As part of the planning and environmental analysis required prior to Federal undertakings, literature and records searches have been conducted for all public lands that would be affected by the Wilderness proposal.
- B. Field inventories have not and will not be conducted for any of the actions proposed in the Wilderness EIS. No direct or indirect effects to historic properties generated by this undertaking could reasonably be expected to occur and, therefore, no stipulations designed to mitigate such affects are proposed in this MOU.

APPENDIX 8

- C. With or without wilderness designation of the areas being considered in this EIS, the Bureau will follow standard procedures for assessment and mitigation of effects resulting from site-specific projects in these areas in the future.

IV. IMPLEMENTATION

- A. This MOU will become effective on the date of the last signature on this MOU.
- B. Either party may request revision or cancellation of this agreement by written notice, not less than 30 days prior to the time when such action is proposed.
- C. Any problems resulting from this agreement which cannot be resolved by the Bureau in consultation with the State will be referred to the Secretary of the Interior and the Governor of Utah for resolution.

Date

7-13-89

Utah State Director

Bureau of Land Management

Date

7-20-89

Utah State Historic Preservation Officer

APPENDIX 9

METHODOLOGY FOR ESTIMATING ECONOMIC IMPACTS

INTRODUCTION

Economic impacts are derived from predicted changes, or wilderness limitations on reasonably foreseeable potential changes, in certain uses within the WSAs. While these are termed "economic" impacts, they are essentially financial impacts related to employment, local sales, and government revenues.

The analysis does not represent the more theoretical use of the term "economic," sometimes used in connection with "willingness-to-pay" and other user or public value studies. While public value studies (such as Krutilla, 1978) are of interest, a primary economic issue throughout the BLM wilderness review process has been the alleged adverse effects on the local economy of Utah counties and communities. Consequently, the EIS focuses on the financial aspects.

SIGNIFICANCE OF ECONOMIC CHANGE

Because of many variables, approximate information, and other analysis parameters, it is difficult to predict and trace economic impacts. However, certain assumptions are made and the EIS analysis does address those aspects considered to be most common or significant. Utah law (commonly referred to as S.B. 170) defines a significant impact as follows: "To employ more than 500 people or to cause the population of an affected unit of local government to increase by more than 5 percent . . ." Although not specified in the law, it is assumed that a decrease of 500 people or 5 percent also would be defined as significant. The 5 percent rule has been interpreted as the change in any 1 year over and above the baseline population and employment projections prepared by the Utah Office of Planning and Budget (Barber, 1986).

BASELINE POPULATION AND EMPLOYMENT

The primary source of population and employment baseline information for the Final EIS is the document titled "1987 Baseline Projections" (Utah Office of Planning and Budget, 1987). This was the most recent information available at the time work was started to revise the individual WSA portions of the Final EIS. Information is provided in the EIS for each county and/or multi-county district (MCDs). It includes four data points: actual 1980, estimated 1990, projected 2000, and projected 2010. Information regarding

activities within WSAs and the related financial considerations are based primarily on BLM file data and various other references. Three types of activities in WSAs have sufficient economic implications to warrant specific consideration. Data sources for these are shown in Table 9.1 and briefly described as follows:

Table 9.1
Direct Employment/Output Ratios

Output	Volume I	Volumes II-VI
	Annual Labor/Output Unit (Full and Part Time Jobs)	Sales/Output Unit
Mining		
Oil	.0475/Thousand barrels	
Gas	.0023/Million cubic feet	
Copper	.0108/Metric tons	
Gold	.00082/Troy ounces	
Silver	.047/Thousand troy ounces	
Lead	.007/Metric tons	
Uranium	.065/Thousand pounds	
	.156/Thousand short tons	
Livestock		
Forage	.00053/AUM	\$ 20.00/AUM
Recreation		
Noncommercial Use	.00009/visitor day	\$ 4.10/visitor day
Commercial Land	.0012/visitor day	\$ 50.00/visitor day
Commercial River Use	.0024/visitor day	\$ 50.00/visitor day

Sources: BLM regulations and file data.

Livestock Grazing

Most livestock information comes from BLM allotment files and use is prorated to fit WSA boundaries after consideration of number of AUMs, forage use patterns within each allotment, and time of use. Generally, livestock permittees and the hired labor required to manage livestock, use the WSAs for only a portion of their total ranching operations. Data from the Utah Department of Agriculture, Utah Bureau of Economic Analysis, and the Census of Agriculture were reviewed in preparing the EIS estimates of grazing employment and economic impacts.

The EIS also includes general figures for livestock sales (gross income from sales attributed to livestock production from the WSA) and ranchers return to labor and investment (net income portion for the gross sales). The net amount is estimated as about 25 percent of the gross sales.

APPENDIX 9: METHODOLOGY FOR ESTIMATING ECONOMIC IMPACTS

Minerals

Employment and income related to the existing mineral activities in WSAs primarily are based on BLM file data, mining or oil and gas records, "Public Land Statistics-1988," and professional estimates. Potential mineral activities and reasonably foreseeable developments are based on DOE mineral evaluation reports, USGS-USBM minerals reports, BLM file information, input from energy and minerals industries, and professional review by BLM geologists. Although a general assumption is made that certain tar sand and coal developments may be feasible in the long term, no specific predictions of future national or international market conditions are included, due to the many future unknowns and uncertainties involved.

Recreation

Recreation use figures and related employment were derived from BLM file data, plus a combination of other source documents, referenced where applicable. The EIS addresses commercial outfitters and tourism aspects. It does not describe indirect and induced effects (or multiplier effects) which may be associated with recreation activities in the WSAs. Commercial outfitter employment/output ratios are based on an average gross income of \$50 per day from each tour participant. It is assumed that each outfitter trip involves an average employment of portions of two jobs.

Recreation expenditure figures are based on a State-wide average expenditure per day, including both in-State and out-of-State users. The EIS uses an average figure of \$4.10 per day. This is not the gross expenditure of wilderness users, but represents that amount attributed to the local economy per visitor day as a result of nearby wilderness recreation use (Dalton, 1982). It should be noted that most expenses incurred for equipment and food for wilderness recreation are made near the home of the user or at some other point outside the wilderness locale. Commercial outfitter income is contributed to the local economy only when the outfitter is locally based.

Neither the recreation use analysis or the economic analysis reflect a "designation effect." Studies have shown that the publicity associated with wilderness designation may generate some temporary increases in use for some of the little known areas, but the normal use patterns soon return. For some of the Utah WSAs, publicity related to the study process and pre-designation controversy perhaps has generated in-

creased use levels that may actually decline somewhat after designation.

Table 9.2 identifies the annual Federal revenue multipliers for commercial recreation use. Use of multiplier is replaced with actual revenues when available.

Table 9.2
Federal Annual Revenue Multipliers

	Revenue/Unit
Mineral	
Oil & Gas Bonus Bid	\$19.90/acre
Coal Bonus Bid	\$69.96/acre
Oil & Gas Lease Rental	\$2.00/acre
Coal Lease Rental	\$3.00/acre
Geothermal Lease Rental	\$1.00/acre
Average Lease Rental	
Gas Royalty	\$250.00/million cubic feet
Coal Royalty	\$2.00 per ton
Livestock	
Forage	\$1.54/AUM
Recreation	
Private River Use	\$1.50/user day
Average Permit Fee	\$1.00/user day

Sources: BLM regulations and file data.

Forest Products

Commercial harvest of forest products is not occurring in the WSAs. Therefore, commercial sales of forest products is not contributin to sales in the local economy. Harvest of firewood and fence posts for personal use has occurred on a limited basis in the past and the value of these products is estimated at \$75 per cord of firewood and \$2 for fence posts. This amount is not equivalent to sales but is the values of forest products to those who gahter them.

Government Revenues

Existing Federal revenues and the portion of these shared with the State were derived primarily from "Public Land Statistics-1988." These fees and other payments to the government related to uses within the WSAs are listed in Table 9.2 and described below. Other typical Federal revenues derived from public lands (such as right-of-way rentals, land sales, and material sales) are not listed because such activities generally are not occurring within the WSAs.

APPENDIX 9: METHODOLOGY FOR ESTIMATING ECONOMIC IMPACTS

Grazing Revenues

Grazing fees paid by livestock operators vary from year to year, as set by a formula and subject to Congressional directive. In recent years, the fee has ranged from \$1.35 to \$1.86 per AUM. The EIS reflects a grazing fee of \$1.54 since that was current for the year when the individual WSA analysis revisions were started.

Mineral Revenues

Mineral revenues primarily include lease bonus bids, lease rental fees, and royalties paid on production quantities. These revenues vary from tract to tract depending on when leasing occurred, the desirability and location of each tract, market conditions, and other factors. The EIS uses representative figures. The Oil and Gas Leasing Act Amendment of 1987 set the minimum lease fee at \$2 per acre for new leases, as compared to the average of \$1.52 used in the Draft EIS. Coal lease rental fees are computed as \$3 per acre.

Recreation Revenues

A user fee is charged for all commercial recreation use and for private recreation use in certain locations (see Table 9.3). These fees are set by regulation.

The commercial fees are based on a schedule tied to the adjusted gross sale per user day. The EIS uses a representative fee of \$1 per permit for all recreation revenue.

Forestry Revenues

Very limited, if any, commercial harvest has or is expected to come from the WSAs, due to difficult access to the few stands of saw timber and due to the large, more accessible volumes of pinyon-juniper at other locations. Therefore, commercial forestry revenues are not a factor for consideration in the Final EIS. For personal use the current charges are \$5 per cord of firewood and \$0.25 per fence post.

Table 9.3
Commercial Recreation User Day Fee Schedule

Adjusted Daily Charge Collected by Permittee from Each Participant	Fee Paid to the BLM Per User Day		
	1984	1985	1986
\$ 8.00 or less	\$.25	\$.25	\$.25
8.01 to 20.00	.30	.30	.40
20.01 to 35.00	.45	.60	.80
35.01 to 50.00	.60	.95	1.80
50.01 to 75.00	.80	1.35	1.90
75.01 to 100.00	1.05	1.80	2.60
100.01 to 125.00	1.30	2.35	3.40
125.01 to 150.00	1.50	2.80	4.10
150.01 to 175.00	1.80	3.30	4.90
175.01 to 200.00	2.00	3.80	5.50
200.01 to 250.00	2.40	4.55	6.75
250.01 to 300.00	2.90	5.55	8.25
Over \$300.00	(a)	(b)	(c)

Sources: BLM regulations and file data.

- (a) 1 percent of adjusted daily charge per participant.
- (b) 2 percent of adjusted daily charge per participant.
- (c) 3 percent of adjusted daily charge per participant.

APPENDIX 10

MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

INTRODUCTION

The favorability (f) and certainty (c) rating system developed through a BLM/U.S. Department of Energy (DOE) contract with Science Applications, Inc. (SAI, 1982) was used to determine certain quantitative parameters for various mineral favorability ratings. Appendix 5 explains the SAI rating system. This rating system has also served as a guide for determining surface disturbance estimates in the WSAs for the various mineral and energy resources.

The Draft EIS projected surface disturbances for all "f" ratings, based on the SAI rating system and an

indeterminate time frame. The Final EIS, however, projects surface disturbance only in those WSAs where a review of minerals and economic data indicates that exploration or development of a given mineral commodity would likely occur in the foreseeable future (see Appendix 6 in Volume I). This assumption has resulted in substantially lower projections of surface disturbance; however, it more accurately reflects what is actually expected to occur in the individual WSAs in the foreseeable future. Table 10.1 lists the surface disturbance estimated for the exploration or development of leasable and locatable minerals for each of the WSAs.

Table 10.1
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
1	North Stansbury Mountains	No Action	2	0	2	1
		All Wilderness	1	0	1	0
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	2	0	2	1
2	Cedar Mountains	No Action	0	0	0	0
		All Wilderness	0	0	0	0
3	Deep Creek Mountains	No Action	74	4	78	6
		All Wilderness	26	4	30	4
		Partial Wilderness				
		Designated	18	0	18	2
		Nondesignated	56	4	60	4
4	Fish Springs	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
5	Rockwell	No Action	0	0	0	0
		All Wilderness	0	0	0	0
6	Swasey Mountain	No Action	48	2	50	5
		All Wilderness	14	2	16	2
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	48	2	50	5
7	Howell Peak	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
8	Conger Mountain	No Action	0	20	20	6
		All Wilderness	0	0	0	0

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	Estimated Miles of New Access Road
9	Notch Peak	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Large Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
		Small Partial Wilderness				
		Designated	0	0	0	0
10	King Top	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
11	Wah Wah Mountains	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
12	Cougar Canyon	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
13	Red Mountain	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
14	Cottonwood Canyon	Nondesignated	0	0	0	0
		No Action	19	0	19	6
		All Wilderness	5	0	5	2
		Partial Wilderness				
		Designated	6	0	6	2
15	LaVerkin Creek Canyon	Nondesignated	2	0	2	1
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
16	Deep Creek	No Action	0	0	0	0
		All Wilderness	0	0	0	0
17	North Fork Virgin River	No Action	0	0	0	0
		All Wilderness	0	0	0	0
18	Orderville Canyon	No Action	0	0	0	0
		All Wilderness	0	0	0	0
19	Parunuweap Canyon	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Large Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
		Small Partial Wilderness				
		Designated	0	0	0	0
20	Canaan Mountain	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
21	Moquith Mountain	Nondesignated	0	0	0	0
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
22	The Blues	No Action	0	81	81	23
		All Wilderness	0	1	1	1
23	Mud Spring Canyon	No Action	0	8	8	10
		All Wilderness	0	0	0	0

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
24	Parla-Hackberry	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
25	The Cockscomb	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
26	Wahweap	No Action	0	64	64	22
		All Wilderness	0	24	24	12
		Partial Wilderness				
		Designated	0	20	20	10
		Nondesignated	0	42	42	12
27	Burning Hills	No Action	0	44	44	12
		All Wilderness	0	4	4	2
		Partial Wilderness				
28	Death Ridge	No Action	0	44	44	12
		All Wilderness	0	4	4	2
		Partial Wilderness				
29	Phipps-Death Hollow	No Action	0	320	320	20
		All Wilderness	0	30	30	6
		Partial Wilderness				
		Designated	0	30	30	8
		Nondesignated	0	0	0	0
30	Steep Creek	No Action	6	1	7	2
		All Wilderness	2	1	3	1
		Large Partial Wilderness				
		Designated	2	1	3	1
		Nondesignated	0	0	0	0
		Small Partial Wilderness				
		Designated	1	1	2	1
		Nondesignated	5	0	5	1
		Partial Wilderness				
31	North Escalante Canyons/The Gulch	No Action	17	46	63	21
		All Wilderness	5	6	11	5
		Large Partial Wilderness				
		Designated	3	4	7	3
		Nondesignated	10	2	12	5
		Small Partial Wilderness				
		Designated	2	0	2	1
		Nondesignated	12	26	38	14
		Partial Wilderness				
32	Carcass Canyon	No Action	23	42	65	20
		All Wilderness	7	2	9	4
		Partial Wilderness				
33	Scorpion	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
34	Escalante Canyons Tract 5 ISA	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
35	Fifty Mile Mountain	No Action	27	70	97	30
		All Wilderness	8	10	18	7
		Large Partial Wilderness				
		Designated	4	0	4	1
		Nondesignated	15	50	65	28
		Small Partial Wilderness				
		Designated	2	0	2	1
		Nondesignated	20	60	80	29
		Partial Wilderness				

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
36	Mt. Ellen-Blue Hills	No Action	0	3,000	3,000	5
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
37	Bull Mountain	Nondesignated	0	3,000	3,000	5
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
38	Dirty Devil	Designated	0	0	0	0
		Nondesignated	0	0	0	0
		No Action	55	6	61	18
		All Wilderness	16	6	22	7
39	Horseshoe Canyon (South)	No Action	0	35	35	15
		All Wilderness	0	15	15	7
		Large Partial Wilderness				
		Designated	0	14	14	6
40	French Spring-Happy Canyon	Nondesignated	0	1	1	1
		Small Partial Wilderness				
		Designated	0	10	10	5
		Nondesignated	0	5	5	2
41	Fiddler Butte	No Action	6	5,553	5,559	24
		All Wilderness	8	3	9	4
		Partial Wilderness				
		Designated	0	0	0	0
42	Mt. Pennell	Nondesignated	6	5,553	5,559	24
		No Action	84	15,116	15,152	59
		All Wilderness	10	16	28	11
		Large Partial Wilderness				
43	Mt. Hillers	Designated	4	1	5	2
		Nondesignated	30	12,817	12,847	47
		Small Partial Wilderness				
		Designated	0	0	0	0
44	Little Rockies	Nondesignated	34	15,118	15,152	59
		No Action	57	8	65	19
		All Wilderness	17	8	25	9
		Partial Wilderness				
45	Mancos Mesa	Designated	17	8	25	9
		Nondesignated	0	0	0	0
		No Action	98	0	96	20
		All Wilderness	29	0	29	5
46	Grand Gulch ISA Complex	Partial Wilderness				
		Designated	15	0	15	3
		Nondesignated	40	0	40	7
		No Action	8	0	8	2
47	Mancos Mesa	All Wilderness	3	0	3	1
		No Action	44	50	94	30
		All Wilderness	13	10	23	8
		Partial Wilderness				
48	Grand Gulch ISA Complex	Designated	12	10	22	8
		Nondesignated	8	4	10	2
		No Action	0	20	20	8
		All Wilderness	0	0	0	0
49	Grand Gulch ISA Complex	Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	20	20	8
		No Action	0	0	0	0

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
47	Road Canyon	No Action	0	20	20	8
		All Wilderness	0	0	0	0
		Large Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	0	0	0
		Small Partial Wilderness				
		Designated	0	0	0	0
48	Fish Creek Canyon	Nondesignated	0	10	10	4
		No Action	0	20	20	8
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
49	Mule Canyon	Nondesignated	0	0	0	0
		No Action	0	20	20	8
		All Wilderness	0	0	0	0
50	Cheesebox Canyon	No Action	0	0	0	0
		All Wilderness	0	0	0	0
51	Dark Canyon ISA	No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
52	Butler Wash	Nondesignated	0	0	0	0
		No Action	0	0	0	0
53	Bridger Jack Mesa	All Wilderness	0	0	0	0
		No Action	17	0	17	6
54	Indian Creek	All Wilderness	5	0	5	2
		No Action	0	0	0	0
55	Behind The Rocks	All Wilderness	0	0	0	0
		No Action	42	22	64	18
56	Mill Creek Canyon	All Wilderness	14	0	14	6
		No Action	0	40	40	8
57	Negro Bill Canyon	All Wilderness	0	0	0	0
		No Action	0	40	40	10
58	Horseshoe Canyon (North)	All Wilderness	0	0	0	0
		No Action	24	26	50	21
59	San Rafael Reef	All Wilderness	7	8	13	5
		No Action	202	0	202	32
60	Crack Canyon	All Wilderness	80	0	80	12
		No Action	98	1	99	12
61	Muddy Creek	All Wilderness	28	1	29	6
		No Action	42	0	42	9
62	Devils Canyon	All Wilderness	12	0	12	4
		No Action	0	0	0	0
63	Sids Mountain/Sids Cabin	All Wilderness	0	0	0	0
		No Action	73	10	83	25
		All Wilderness	22	10	32	10
		Partial Wilderness				
		Designated	22	2	24	6
64	Mexican Mountain	Nondesignated	0	8	8	4
		No Action	28	50	78	22
		All Wilderness	8	10	18	7
		Partial Wilderness				
		Designated	8	10	18	6
65	Jack Canyon	Undesignated	16	0	16	2
		No Action	0	161	161	10
		All Wilderness	0	11	11	3

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
66	Desolation Canyon	No Action	0	420	420	100
		All Wilderness	0	143	143	54
		Large Partial Wilderness				
		Designated	0	80	80	37
		Nondesignated	0	190	190	30
		Small Partial Wilderness				
		Designated	0	40	40	37
67	Turtle Canyon	Nondesignated	0	330	330	54
		No Action	0	330	330	20
		All Wilderness	0	10	10	3
		Partial Wilderness				
		Designated	0	10	10	3
68	Floy Canyon	Nondesignated	0	60	60	10
		No Action	0	170	170	40
		All Wilderness	0	10	10	5
		Partial Wilderness				
		Designated	0	3	3	1
69	Coal Canyon	Nondesignated	0	107	107	20
		No Action	0	170	170	55
		All Wilderness	0	50	50	20
		Partial Wilderness				
		Designated	0	22	22	8
70	Spruce Canyon	Nondesignated	0	128	128	44
		No Action	0	161	161	31
		All Wilderness	0	41	41	6
		Partial Wilderness				
		Designated	0	31	31	4
71	Flume Canyon	Nondesignated	0	40	40	6
		No Action	0	182	182	41
		All Wilderness	0	32	32	14
		Partial Wilderness				
		Designated	0	6	6	3
72	Westwater Canyon	Nondesignated	0	116	116	33
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
		Partial Wilderness				
		Designated	0	0	0	0
73	Winter Ridge	Nondesignated	0	0	0	0
		No Action	0	2,137	2,137	76
		All Wilderness	0	32	32	12
		Partial Wilderness				
		Designated	0	3	3	2
A	Red Butte	Nondesignated	0	1,069	1,069	44
		No Action	0	0	0	0
		All Wilderness	0	0	0	0
B	Spring Creek Canyon	All Wilderness	0	20	20	3
		Partial Wilderness				
		Designated	0	0	0	0
		Nondesignated	0	2	2	1
		No Action	0	0	0	0
c	The Watchman	All Wilderness	0	0	0	0
		No Action	0	0	0	0
D	Taylor Creek Canyon	All Wilderness	0	0	0	0
		No Action	0	0	0	0
E	Goose Creek Canyon	All Wilderness	0	0	0	0
		No Action	0	0	0	0
F	Beartrap Canyon	All Wilderness	0	0	0	0
		No Action	0	0	0	0
G	Fremont Gorge	All Wilderness	0	0	0	0
		No Action	0	0	0	0

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

Table 10.1 (Continued)
Estimated Mineral-Related Surface Disturbance by WSA

Map Reference Number	WSA Name	Alternatives	Estimated Surface Disturbance			Estimated Miles of New Access Road
			Locatable Minerals (Acres)	Leasable Minerals (Acres)	Total Minerals (Acres)	
H	Lost Spring Canyon	No Action	0	40	40	12
		All Wilderness	0	0	0	0
I	Daniels Canyon	No Action	0	0	0	0
		All Wilderness	0	0	0	0
J	South Needles	No Action	0	0	0	0
		All Wilderness	0	0	0	0

NO ACTION ALTERNATIVE

• Leasable Minerals

• Oil and Gas

The quantitative measurements for assessing the favorability for a given mineral resource within a WSA is based on the estimated size of potential deposits (SAI, 1982). The favorability breakdown for oil and gas is:

f1: No potential.

f2: Potential for less than 10 million barrels of oil and less than 60 billion cubic feet of gas.

f3: Potential for 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of gas.

f4: Potential for more than 50 million barrels of oil and more than 300 billion cubic feet of gas.

Based on these quantitative breakdowns, an analysis was made of oil and gas fields in Utah to correlate field production, reserves, and sizes of the fields. Based on this examination, the breakdown in Table 10.2 was used as an overall assumption of the field size in an area.

These figures represent an average. The range for f2 fields was 40 to 4,000 acres, the range for f3 fields was 1,500 to 7,500 acres, and the range for f4 fields was 15,000 to 45,000 acres.

Table 10.2
Oil and Gas Field Sizes

Rating	Acres	Potential
f1	0	0 barrels of oil; 0 cubic feet of gas
f2	2,500	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
f3	5,000	10 to 50 million barrels of oil; 60 to 300 billion cubic feet of gas
f4	25,000	More than 50 million barrels of oil; more than 300 billion cubic feet of gas

Source: SAI, 1982.

It is also assumed that well spacing within a field would range from 40 to 640 acres, with an average well spacing of 160 acres. Each well would disturb an average of 10 acres for pad and access, and production tanks and pipelines would be established on pre-existing disturbed areas involved with pad and access locations.

Based on these assumptions, acreage disturbances from potential oil and gas development was estimated by using the following calculations: Estimated field acreage (160-acre spacing) times 10 acres disturbed (well) equals acres disturbed.

This corresponds to the following disturbance for development per "f" rating: f2, 160 acres; f3, 310 acres; and f4, 1,560 acres. In those WSAs where exploratory drilling is projected, it is anticipated that two wells would be drilled in f2 areas and four wells would be drilled in f3 areas. Surface disturbance would be up to 10 acres per pad and access road. Individual WSA analysis occasionally resulted in a modification of these figures based on local conditions such as topography. It is also assumed that each well will employ an average of 10 people and that it will take 3 to 6 months to drill.

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE ASSUMPTIONS AND ESTIMATES

• Tar Sand

The rating breakdown for tar sand is as follows (SAI, 1982):

- f1: No potential.
- f2: Potential for less than 100 million barrels of oil in-place.
- f3: Potential for 10 to 500 million barrels of oil in-place.
- f4: Potential for more than 500 million barrels of oil in-place.

No tar sand development is projected in any of the WSAs in the short-term future. However, with the No Action/No Wilderness Alternative, the Final EIS does project tar sand development in the long-term future in the Winter Ridge, Fiddler Butte and French Spring-Happy Canyon WSAs. This represents a modification of the assumptions made in the Draft EIS.

Development projections for the Tar Sand Triangle Special Tar Sand Area (STSA), which includes the Fiddler Butte and French Spring-Happy Canyon WSAs, were analyzed in the Tar Sand Triangle Draft EIS (USDI, NPS/BLM, 1984) and the Utah Combined Hydrocarbon Leasing Regional Final EIS (USDI, BLM, 1984b). In-situ development is assumed for this area. It is estimated that in situ production of oil from the tar sand would disturb approximately 40 percent of the acreage available for development. Development figures include drill pads, pipelines, roads, and other surface facilities. Production levels of between 5,000 and 30,000 barrels per day would require 1,150 to 6,900 acre-feet of water. The most likely water source would be the Dirty Devil River. A work force of between 60 to 300 employees would be required for 45 to 270 years.

Development projections for the P R Spring STSA, which includes the Winter Ridge WSA, were analyzed in the P R Spring Combined Hydrocarbon Lease Conversion Final EIS (USDI, BLM, 1985f) and the Utah Combined Hydrocarbon Leasing Regional Final EIS (USDI, BLM, 1984b).

• Coal

The rating breakdown for coal is as follows (SAI, 1982):

- f1: No Potential.
- f2: Potential for only small tonnage deposits, with thin and discontinuous seams less than 28 inches for bituminous or higher rank, and 5 feet for sub-bituminous or lower rank coal.
- f3: Potential for moderate tonnage deposits, with seams approximately 28 inches for bituminous or higher rank, and 5 feet for sub-bituminous or lower rank coal.
- f4: Potential for large tonnages of coal, with seams greater than 28 inches for bituminous or higher rank, and greater than 5 feet for sub-bituminous or lower rank coal.

Coal, unlike many other mineral resources, usually occurs as large tabular bodies, parts of which commonly intersect the land surface. Thus, the degree of certainty that the resource occurs, even over very large areas, can be as high as 100 percent.

The maximum stripping ratio for a surface mine is assumed to be 10:1. The maximum depth for a coal strip mine is assumed to be 200 feet. For coal deposits identified as being surface minable, it is assumed that 100 percent of the minable area would be disturbed. The maximum depth for an underground coal mine is assumed to be 3,000 feet. The minimum minable coal seam thickness is assumed to be 3 feet.

No coal development is projected to take place in any of the WSAs in the short-term future. However, with the No Action/No Wilderness Alternative, the Final EIS does project coal development in the long-term future in the Kaiparowits coal field, the Henry Mountain coal field, and in the Book Cliffs. The WSAs in which the projected long-term coal development would take place are Mud Spring Canyon, The Blues, Wahweap, Death Ridge, Burning Hills, Carcass Canyon, and Fifty Mile Mountain on the Kaiparowits Plateau, Mt. Ellen-Blue Hills in the Henry Mountains, and Desolation Canyon and Turtle Canyon in the Book Cliffs. This

APPENDIX 10: MINERAL AND ENERGY SURFACE DISTURBANCE
ASSUMPTIONS AND ESTIMATES

represents a modification of the assumptions made in the Draft EIS.

Development projections for potential coal mines on the Kaiparowits Plateau and Book Cliffs are based on the Uinta-Southwestern Utah Final EIS (USDI, BLM, 1981c), Development of Coal Resources in Southern Utah Final Environmental Statement (USDI, USGS, 1979), and an analysis of coal mines typical of the Utah area. The depth of the coal resource on the Kaiparowits Plateau and Book Cliffs requires underground mining methods. No assumptions on specific mining methods such as longwall or room and pillar have been made. However, several general assumptions can be made. Location of surface facilities would generally be in canyons or drainages where the coal could be more easily accessed. The size of the individual coal operations, typical of the intermountain area, differ. Each surface facility site, including access roads, would occupy up to 20 acres. Additional temporary disturbance would result from exploratory drilling activities. Employees, including supervisory personnel, would number from 20 to 300. An undetermined number of these employees would come from the local work force. Operations would last from 30 to 40 years. All disturbed areas would be reclaimed upon abandonment. It is assumed that one to two operations could be located in each of the WSAs.

Assumptions regarding a potential surface mine in the long-term future in the Wildcat Mesa portion of the Mt. Ellen-Blue Hills WSA come from BLM files. The surface mine would produce about 2 million tons of coal per year over a 30-year period. The project would employ about 200 workers. Up to 2,825 acres would be available for coal development, with an additional 175 acres being required for transportation systems, including access roads and a 15-mile conveyor system. Approximately 182 acre/feet of water would be required per year and would likely come from deep wells.

Locatable Minerals

Uranium

The rating breakdown for uranium is as follows (SAI, 1982):

f1: No potential.

f2: Potential resources of less than 500 metric tons of refined uranium oxide.

f3: Potential resources of 500 to 1,000 metric tons of uranium oxide.

f4: Potential resources in excess of 1,000 metric tons of uranium oxide.

Based on these quantitative breakdowns for deposit sizes, calculations were made to ascertain typical acreages involved with each deposit. Several assumptions were required for these calculations. The first assumption was that the minimum grade that could be economically developed within the foreseeable future is 0.1 percent uranium. Deposits of this grade result in 2 lb uranium; a 1,000-ton deposit would yield 2,000 lb uranium. The second assumption was that the average thickness of such deposits would be 9 feet. These assumptions were then used in a reserve calculation. The calculation is as follows:

lb of uranium = (sq. ft/acre)(acres)(thickness in ft)(lb/ton)(4,000 lb/cu yd) / ((27 cubic foot/cubic yard)(2,000 lb/ton))

By using the above-listed assumptions, the equation can be manipulated to yield total acres underlain by a deposit of a given size as follows:

acres = (size of deposits in lb)(27 cubic foot/cubic yard)(2,000 lb/ton) / ((sq. ft/acres)(thickness in ft)(lb U3O8/ton) (4,000 lb/cubic yard))

When the various deposit sizes were run through the equation, the acreages (rounded up to the nearest 10) shown in Table 3 were assumed for each favorability class.

It was then assumed that development of a uranium deposit would require use of the entire overlying surface for development drilling on 50-foot spacing, ventilation shafts, access, mine entryways, and other ancillary facilities.

Table 10.3
Uranium Potential and Surface Disturbance

Table with 3 columns: Rating, Tons Refined, Acres Disturbed. Rows include f1 (No potential), f2 (Up to 500 tons, 0-20 acres), f3 (Up to 1,000 tons, 0-30 acres), and f4 (More than 1,000 tons, 0-40 acres).

Source: SAI, 1982; modified by BLM, 1987.

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Where there is projected exploration for locatable minerals in a given WSA, it is assumed that 5 percent of the mining claims located in a WSA would be explored. Such exploration would result in 5 acres of surface disturbance per explored claim, which includes assessment work. In some instances, locatable minerals such as copper and silver are found in association with uranium. In these instances, the disturbed acreage has been calculated under one mineral commodity. For analysis purposes, it is assumed that for each 5 acres of disturbance, four people would be involved for a period of 10 days.

There are 21 WSAs within the State which have low "f" and "c" ratings; however, unpatented mining claims exist within the WSAs. As stated previously in this Appendix, surface disturbances have only been projected in WSAs which have high "f" and "c" ratings and a determination has been made that the mineral commodity will be explored or developed in the foreseeable future. It is assumed, however, that annual assessment work will still be conducted on some of the claims in the 21 WSAs, subject to the provisions of the 43 CFR 3802 regulations. It is estimated that within the 21 WSAs, 340 acres would be disturbed with the No Action/No Wilderness Alternative.

ALL WILDERNESS AND PARTIAL WILDERNESS ALTERNATIVES

• Leasable Minerals

Leasable minerals could be developed on those mineral leases existing at the time of wilderness designation, as allowed by BLM Manual 8560, Part 15, Paragraph 2(b), which states that:

"Reasonable stipulations for the protection of the wilderness character of the land must be incorporated into mineral leases, permits, and licenses covering lands within BLM-administered wilderness. Stipulations must be consistent with the use of the land for purposes for which they are leased, permitted, or licensed."

However, it was assumed for analyses purposes that, with the exception of leases presently under production or held by unit agreements, leases would (1) expire prior to designation and would not be reissued; (2) would remain closed to leasing; and (3) those areas designated as wilderness would remain closed to leasing upon designation. Disturbance on leases held

by production or unit agreements was estimated on a site-specific basis.

• Locatable Minerals

For the All Wilderness Alternative, it is assumed that 1.5 percent of the mining claims currently existing in a given WSA would be explored or developed. Such exploration or development would result in 5 acres of surface disturbance per claim, which includes assessment work.

Under the Partial Wilderness Alternative, determinations were made as to how much surface disturbance would occur within the partial wilderness boundary, as well as in those areas not designated. These determinations were based on the minerals data that is available for each WSA. Designated wilderness would be withdrawn from mining claim location at the time of designation. Wilderness impairing activities would be allowed only on those mining claims which have a valid discovery prior to designation.

RANGELAND, WILDLIFE, AND WATERSHED DEVELOPMENT ASSUMPTIONS

Rangeland, wildlife, and watershed developments identified in the current BLM land use plans are projected for several WSAs in the foreseeable future. These developments are discussed in detail in the Description of the Alternatives for the individual WSA analyses. It is also recognized that wilderness designation would preclude certain of the projected developments, such as reservoirs and vegetation treatments. Other developments would be allowed if determined necessary for the purpose of resource protection and the effective management of various resources, if consistent with wilderness protection standards. Implementation of rangeland developments will result in varying amounts of surface disturbance. For analysis purposes, the following assumptions have been made for the No Action/No Wilderness Alternatives.

pipelines:	1 acre disturbance per mile
livestock reservoirs:	1 acre disturbance per reservoir
spring developments:	1/4 acre disturbance for each development
wells:	1/4 acre disturbance for each well
fences:	1 acre disturbance per mile
guzzlers:	1/2 acre disturbance for each guzzler

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It is recognized that the figures used above are averages and that individual developments would differ in size. No access road construction is projected to be required for these developments.

For rangeland developments that would be allowed following wilderness designation, it is assumed that there would be about 20 percent less surface disturbance than assumed for the No Action/No Wilderness Alternative. This is due to the restrictions that wilderness designation would have on the design and construction of the developments.

Twenty-two WSAs are projected to have vegetation treatments with the No Action/No Wilderness Alternative. These treatments are identified in BLM's land use planning documents. However, budget and other restraints will substantially restrict vegetation treatment activities to a level substantially below that analyzed in the Draft EIS. The most common form of vegetation treatment practice would be pinyon-juniper woodland chaining, burning, and seeding. However, sagebrush burning and seeding, drilling and seeding, and tillage and other vegetation treatment practices are also projected. The size of the various proposed vegetation treatments varies with each WSA. It is assumed that 100 percent of the surface would be disturbed within each development site.

ACCESS TO IN-HELD STATE LANDS

Fifty-six WSAs contain 193,520 acres of in-held State of Utah lands, including split-estate lands. Approximately 79,559 acres of these lands within 130 sections are leased for minerals (UDNRE, DSLF, 1988). In those WSAs where mineral exploration and/or development is projected on adjacent public lands, road access to State lands under mineral lease is assumed. Construction of access roads would disturb an average of 2 acres per mile except in difficult topography where 3.5 acres per mile has been assumed. Because no specific proposals to access and develop State lands is available, BLM has projected surface disturbance based on the most likely access routes. If no mineral exploration or development is projected in a given WSA, no access to in-held State lands is projected, even if they are leased for minerals. Access to some inheld State land would be extremely difficult due to topography and has not been projected.

OTHER PROJECTED SURFACE DISTURBANCE

Other surface-disturbing activities projected to occur in WSAs include community expansion, campground expansion and development, and development of municipal water sources. It is assumed that surface disturbance would cover 100 percent of the specific project areas. These surface disturbances are further assumed to continue over the long term as these projects would be in place for several years. Descriptions of the individual projects are discussed in detail in the individual WSA analyses.

SUMMARY OF RATIONALE FOR THE FIVE INSTANT STUDY AREAS PREVIOUSLY REPORTED AS UNSUITABLE FOR WILDERNESS DESIGNATION^a

INSTANT STUDY AREA	UNIT ACREAGE AND LOCATION	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
		WILDERNESS (acres)	NON-WILDERNESS (acres)		
BOOK CLIFFS MOUNTAIN BROWSE NATURAL AREA	400 UINTAH COUNTY T15S, R 25E	0	400	NONE	Naturalness is not outstanding due to a fence (with bladed fence line), a way, and a vegetation spraying project along the west edge. Because of the small size, opportunities for solitude and primitive recreation are less than outstanding.
DEVILS GARDEN OUT- STANDING NATURAL AREA	640 GARFIELD COUNTY T37S, R4E	0	640	NONE	The area contains two roads, a way, and a developed picnic site. The topography, the low growing vegetation, and the proximity to the Hole-in-the Rock county road preclude opportunities for solitude. Portions of the area do not offer outstanding opportunities for primitive recreation activities.
ESCALANTE CANYONS TRACT 1 OUTSTANDING NATURAL AREA	360 GARFIELD COUNTY T35S, R7E	0	360	NONE	A small part (41 acres) lacks naturalness. The relatively flat or open topography and scattered pin-yon-juniper trees preclude outstanding opportunities for solitude. Opportunities for primitive recreation are less attractive than in other, nearby locations and are not considered to be outstanding.
JOSHUA TREE NATURAL AREA	1,040 WASHINGTON COUNTY T43S, R18W	0	1,040	NONE	Except on 160 acres, the area does not offer outstanding opportunities for solitude because of the small size, openness of the desert shrub vegetation, and the lack of topographic relief. The area has limited opportunities for primitive recreation activities.
LINK FLAT NATURAL AREA	792 EMERY COUNTY T23S, R9E	0	792	NONE	The area has human imprints, including 3.75 miles of road, 1 mile of way, one small reservoir for livestock, mining claim location markers, and evidence of claim assessment work. It does not have outstanding opportunities for solitude and primitive recreation.

^aNOTE: Study results for all of these areas were forwarded to the Secretary and to the President, and in April 1985 were reported to Congress.

APPENDIX 11
TABLE 11.2
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-WEST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
1	NORTH STANSBURY MOUNTAINS	020-089	10,480	10,480	0	About 95 percent of the area is natural and about 58 percent has outstanding solitude and primitive recreation. Diverse scenic values are present. Conflicts with other uses are not present, except for past mineral prospecting on about 480 acres on the east side of the WSA. Wilderness management would be consistent with adjacent National Forest management to preserve the natural environmental values on the crest of the mountain range.	None
2	CEDAR MOUNTAINS	202-094	50,500	0	50,500	None	The area is natural but the opportunity for primitive and unconfined recreation is not outstanding. Water is lacking, vegetation lacks variety, and scenic values are common. Supplemental values are lacking in most of the area.
3	DEEP CREEK MOUNTAINS	020-060	68,910	57,384	11,526	All of the proposed area is natural and has outstanding solitude and primitive and unconfined recreation. High mountain peaks are distinguishing scenic features. Many vantage points occur for views outward to the contrasting desert. Special features include Utah cut-throat trout, giant stonefly, grapefern, and bristlecone pine. Diversity of terrain and vegetation exists. Some conflict with potential mineral discovery may exist, but the center of the range appears to have less potential than around the edges of the proposed area. Mineral potential, while recognized, is of lesser importance than mineral values in the area not proposed for wilderness.	The north end of the WSA has high mineral potential (gold, lead, zinc, mercury, molybdenum, silver, and beryllium) which outweighs wilderness values. Small areas along the southeast edge of the WSA lack outstanding opportunities for primitive recreation, lack solitude, and possess low visual interest.
4	FISH SPRINGS	050-127	52,500	33,840	18,660	All the area is natural. About 74 percent of the proposed area has outstanding opportunities for solitude and primitive recreation. Geologic sightseeing and study are above average, with 28,000 acres of blockfaulting visible on the mountain. This is a distinctive example of blockfault landform. No conflict exists with other land uses or with minerals.	The foothills (or benchlands) lack solitude and outstanding opportunities for primitive recreation. The foothills have open visual conditions common to the West Desert region.

APPENDIX 11
TABLE 11.2 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-WEST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
5	ROCKWELL	050-186	9,150	0	9,150	None	Opportunities for solitude and wilderness management are limited by proximity of an off-road vehicle (ORV) high use area. Outstanding opportunities for primitive recreation are lacking on about half (45 percent) of the area. Existing Area of Environmental Concern (AEC) designation provided for management and protection of natural values.
6	SWASEY MOUNTAIN	050-061	49,500	34,376	15,124	All of the area is natural. About 94 percent of the proposed area has outstanding opportunities for solitude and primitive recreation. It has high diversity of terrain and vegetation. Scenic vistas are present from high peaks and from the ridge line. Primitive recreation values are enhanced by several springs, many secluded camp areas, and trails made by wild horses. Special features include limestone caves, trilobite beds, wild horses, bristlecone pine, and block fault geologic landform. Little conflict with mineral potential exists within the proposed area.	The north end of the WSA has high potential for locatable minerals, notably disseminated gold. This is separated from the rest of the WSA by a known fault line. The areas in the south part of the WSA, and not recommended, primarily are gently rolling and vegetated, with little opportunity for outstanding solitude and primitive recreation. Special features are not found in this area.
7	HOWELL PEAK	050-077	24,800	14,800	10,000	All the area has naturalness and outstanding solitude. It has rugged terrain and little water which, in some respects, limits extended primitive recreation. A notable special feature is Council Cave, with its large entrance and single room. No conflict has been identified with mineral potential or other land uses.	The area not proposed consists primarily of lower benchlands at the base of the mountain range with little variety of landform, vegetation, and color. Opportunities for outstanding solitude and primitive recreation are lacking. Scattered trilobite beds occur in the area, but other, more extensive, beds are further to the northeast.
8	CONGER MOUNTAIN	050-035	20,400	0	20,400	None	About 30 percent of area lacks outstanding opportunities for solitude due to sparse and low vegetation and relatively flat terrain. Outstanding opportunities for primitive recreation are lacking. The range is an average example of block fault landform. The WSA has little subject matter to attract visitors or for nature study.

APPENDIX 11
TABLE 11.2 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-WEST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION WILDERNESS (acres)	NON-WILDERNESS (acres)	RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
9	NOTCH PEAK	050-078	51,130	28,000	23,130	All the proposed area is natural, with outstanding solitude and primitive recreation opportunities. Landform and vegetation variety are significant. Prominent cliffs, including the 3,000 foot high shear face of Notch Peak, occur along the west side of the area. Scenic vistas are above average. Special features are Notch Peak (a unique topographic and visual attraction) and the bristlecone pine. Little conflict with mineral potential exists since most of the mineralization is outside of the proposed area.	The southern part of the WSA, not proposed, consists of barren or sparsely vegetated foothills which lack solitude and outstanding primitive recreation values. No special features occur in this area to attract visitor interest. The northern part of the WSA, not proposed, is adjacent to ongoing mining activities and lacks solitude due to nearby road systems and mining operations. Less than 1 percent of these areas have outstanding solitude and primitive recreation opportunities.
10	KING TOP	050-070	84,770	0	84,770	None	The area is natural. Outstanding solitude is lacking on about 40 percent of the area. Outstanding primitive recreation for an extended period is limited by lack of water. With the exception of Fossil Mountain, there are no distinctive features or destination points to attract visitors. Fossil Mountain is on the edge of the WSA in proximity to access by vehicles. The 12 in-held State-owned sections are scattered throughout the WSA, and these sections are leased for oil and gas. Road access, if required by future proposals on State lands, would substantially detract from maintenance of wilderness values on the surrounding lands and within the WSA as a whole; therefore resulting in wilderness manageability problems.
11	WAH WAH MOUNTAINS	050-073	42,140	36,382	5,758	All the area is remote and natural, with outstanding solitude and primitive recreation. It is one of the most remote, untouched areas in Utah's west desert. Excellent diversity of terrain and vegetation exists. Dramatic cliffs and ridges provide excellent vistas to the adjacent, surrounding, broad valleys and to distant mountains. At the north end of the area, Crystal Peak exhibits striking white color and is a popular special feature. Large bristlecone pine are another special feature. Little conflict with mineral potential is present.	The areas not proposed are the relatively flat benchland with low vegetation along the east and west sides at the northern end of the WSA. Here open terrain and sparse vegetation, in combination with adjacent roads, provide less than outstanding opportunities for solitude and primitive recreation on about 21 percent of the area.

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
12	COUGAR CANYON	040-123	15,968	6,408	9,560	All of the area is natural. Small portions have outstanding solitude and primitive recreation opportunities. Visual values are high in Pine Park and Pine Park Canyon. Wildlife values include extensive use by cougars, presence of a variety of raptors, and trout in canyon streams within the WSA. No significant conflicts exist with mineral potential or other land uses.	Lands on the northwest of the WSA do not have outstanding opportunities for primitive recreation; visual aspects are common, and diversity of terrain and vegetation is limited. Lands in the south part of the WSA do not have outstanding opportunities for primitive recreation, and diversity of terrain and vegetation is limited.
13	RED MOUNTAIN	040-132	18,290	12,842	5,448	All of the area is natural. Portions have outstanding opportunities for solitude and primitive recreation. The red cliffs have significant visual values. Uranium may exist, but potential for development is low.	Lands not included are at the base of the cliffs, have low wilderness qualities, and potential for urban expansion. Due to proximity of the town of Ivins and open terrain, management of wilderness values may be a problem on 500 acres. Also not included are northern parts of the WSA with low wilderness values.
14	COTTONWOOD CANYON	040-046	11,330	9,853	1,477	All of the area is natural. More than half has outstanding solitude and part has outstanding primitive recreation opportunities. Primitive recreation opportunities would complement adjacent developed Red Cliffs Recreation Area and Quail Creek area. Uranium may exist but potential for development is low.	Three locations along the south of the WSA do not have outstanding opportunities for solitude and primitive recreation. Diversity of terrain and vegetation is limited. A large groundwater aquifer exists and can readily be accessed from these areas for use in nearby communities.
15	LAVERKIN CREEK CANYON	040-153	567	567*	0	This is a small natural area with wilderness value in conjunction with adjacent proposed wilderness in Zion National Park. It has high scenic value and hydrological association with Zion Canyon. Little or no conflict exists with minerals or other land uses.	None
16	DEEP CREEK	040-146	3,320	3,320*	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation, in conjunction with proposed wilderness in Zion National Park. It has high scenic value and hydrological association with Zion Canyon. Little or no conflict exists with minerals or other land uses.	None

* These areas are proposed for wilderness designation only in conjunction with proposed wilderness in the adjacent Zion National Park.

APPENDIX 11

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
17	NORTH FORK VIRGIN RIVER	040-150	1,040	1,040*	0	All of the area is natural. It has high scenic value and hydrological association with Zion Canyon, and has wilderness value in conjunction with proposed wilderness in Zion National Park. Little or no conflict exists with minerals or other land uses. Dam and reservoir potential has been identified on the North Fork of the Virgin River upstream of the WSA. Due to other factors in the Virgin River Basin (Such as endangered fish, National Park riparian ecological needs, and impacts to public lands, etc.), the likelihood of dam construction is low.	None
18	ORDERVILLE CANYON	040-145	1,750	1,750*	0	All of the area is natural. About 67 percent has outstanding opportunities for solitude and primitive recreation. It has high scenic value and hydrological association with Zion Canyon, and has wilderness value in conjunction with proposed wilderness in Zion National Park. Little or no conflict exists with minerals or other land uses.	None
19	PARUNUWEAP CANYON	040-230	30,800	17,888	12,912	All of the area is natural and almost all of it has outstanding opportunities for solitude and primitive recreation. It has high scenic value and hydrological association with Zion Canyon. The deeply incised, narrow canyons are spectacular. Special features include these scenic canyons and a segment of a historic pioneer travel route. Although uranium may exist in the area, the potential for development is low. Dam and reservoir potential has been identified on the East Fork of the Virgin River where it flows through the area. Due to other factors in the Virgin River Basin (such as endangered fish, National Park riparian ecological needs, and impacts to public lands, etc.), the likelihood of dam construction is low. Additionally, the high wilderness values outweigh the other resource use potentials.	The area not proposed on the south side of the WSA lacks diversity of terrain and vegetation. It does not provide outstanding opportunities for solitude and primitive recreation. Also, it has potential for wildlife habitat improvement projects, woodland harvest, and use for nonprimitive recreation.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
20	CANAAN MOUNTAIN	040-143	47,170	33,800	13,370	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Canaan Mountain has a long-standing recognition for outstanding natural character and landscape diversity. Special features include scenic qualities and remnants of an historic lumber operation. Although uranium may exist in the area, the potential for development is low. No significant conflicts exist with other land uses. Most of the area presently is closed to ORV use.	The areas not proposed are around the edges of the WSA and along the base of the mountain. Here conflicting land uses would present wilderness management problems. These include municipal water facilities, a community park inadvertently included in the WSA, and a potential rangeland treatment project.
21	MOQUITH MOUNTAIN	040-217	14,830	0	14,830	None	Although naturalness is present, about half of the area lacks outstanding opportunities for solitude, primitive recreation, and special features. Moquith Mountain often serves as an overflow area for recreationists visiting the adjacent Coral Pink Sand Dunes State Park. The need to accommodate established use associated with developed facilities and vehicular recreation (ORV, dune buggies, etc.) is considered to outweigh the wilderness values.
22	THE BLUES	040-268	19,030	0	19,030	None	Although all the area is natural, less than 16 percent is judged to have outstanding opportunities for solitude or primitive recreation. The entire area is underlain with minable coal. Short-term development of this coal is unlikely, but long-term mining prospects are high. This long-term coal potential is considered to outweigh the wilderness values.
23	MUD SPRING CANYON	040-077	38,075	0	38,075	None	All of the area is natural, 47 percent has outstanding solitude, 37 percent has outstanding opportunities for primitive recreation, and special features are present; however, almost all of the area is underlain with mineable coal. Short-term extraction of this is unlikely, but the long-term coal potential is considered to outweigh the wilderness values.

APPENDIX 11
TABLE 11.3 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
24	PARIA-HACKBERRY	040-247	136,222	95,042	41,180	All of the area is natural. Nearly all of the area has outstanding opportunities for solitude and primitive recreation. Scenic and ecological special features are present. The proposal represents a large area with very high quality wilderness values. Oil and gas resources may exist in the area, but potential for substantial development is considered to be low. Some possible needs exist for salinity control measures on or near the Paria River but there are no plans for projects. The high wilderness qualities of the area are believed to outweigh future salinity development potential. No Man's Mesa has scientific values.	The Paria River corridor is not proposed as wilderness in recognition of traditional use as a vehicular access route. Although this divides the proposed area in two sections, both are sufficiently large to maintain wilderness values. ORV use would be limited to the dry river bed and evidence of such would be removed by seasonal river flows. The southwest portion of the WSA (Deer Range) has naturalness, but is judged to lack outstanding opportunities for solitude and primitive recreation. Parts of the western portion also lack outstanding wilderness qualities.
25	THE COCKSCOMB	040-275	10,080	5,100	4,980	All of the area is natural. Outstanding opportunities for solitude occur on 52 percent of the area and outstanding primitive recreation exists on 54 percent. Scenic quality is high. The Cockscornb is unique as a Colorado Plateau geologic structure. Oil and gas may occur in the area, but the potential for substantial development is low. No conflict would exist with possible future transportation routes, as they could be planned to the south.	Although about 46 to 48 percent of the area has high wilderness values, the easterly portion is not proposed in order to allow for traditional vehicular use along the Paria River corridor, consistent with the Paria-Hackberry WSA. The southern portion of the WSA is not proposed because of the lower wilderness quality and it could possibly be used for future coal transportation routes and provides a more desirable route than through the Paria-Box.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
26	WAHWEAP	040-248	134,400	0	134,400	None	All of the area is natural and about 10 percent has outstanding opportunities for solitude. Although about 17 percent (in six scattered locations) has high scenic values, none of the area is considered to have outstanding opportunities for primitive recreation. Special features include about 1,000 acres of comparatively old pinyon and juniper trees and 11,700 acres of geologic interest; however, they are not of national significance. The WSA is in the southern part of the Kaiparowits coal field and within the Kaiparowits KRCRA. About 12 percent of the area is leased for coal, with pre-existing rights. Although extraction of this coal is not expected in the short term, the most likely future development of coal in the KRCRA would occur in the area of existing leases, and may include those in the Wahweap WSA. Also, configuration of State land and cherry-stemmed existing roads may affect wilderness management. In view of the large size of the area, several partial alternatives were reviewed for potential wilderness designation to focus on locations with highest wilderness attributes and to avoid conflicts, but none of these are found to be suitable for wilderness management. The proposed action for no wilderness designation in the Wahweap WSA is based on overall low wilderness qualities and the long-term future potential for mineral/energy extraction.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
27	BURNING HILLS	040-079	61,550	0	61,550	None	All of the area is natural and about 45 percent has outstanding opportunities for solitude. Although portions have scenic values, none of the area is considered to have outstanding opportunities for primitive recreation. The WSA is in the south-central part of the Kaiparowits coal field and within the Kaiparowits KRCRA. About 21 percent of the area is leased for coal, with pre-existing rights. Although extraction of this coal is not expected in the short term, the most likely future development of coal in the Kaiparowits coal fields would occur on the areas of existing leases, and may include those in the Burning Hills area. The long-term future potential for coal mining is given precedence over the wilderness values.
28	DEATH RIDGE	040-078	62,870	0	62,870	None	All of the area is natural and about 50 percent has outstanding opportunities for solitude. None of the area is considered to have outstanding opportunities for primitive recreation. Cherry-stemmed roads cut into the area in many locations, and would result in an awkward boundary configuration. The potential exists for about 300 acres of vegetation treatment to improve forage. The area is in the central part of the Kaiparowits coal field and within the Kaiparowits KRCRA. About 34 percent of the area is leased for coal, with pre-existing rights. The long-term future potential for coal extraction is considered to outweigh the wilderness values in the area.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
29	PHIPPS-DEATH HOLLOW	ISA	42,731	39,256	3,475	All of the proposed area is natural. About 92 percent has outstanding solitude and 94 percent has outstanding primitive recreation. Special features include scenic, geologic, historic, and archaeological values. It contains Lower and Upper Calf Creek Falls which have high visitor interest. About 87 percent of the area was designated an ONA in 1970, and about 99 percent currently is closed to ORV use. A portion of the area is located in the KGS for carbon dioxide gas, but the proven discovery is to the north of the WSA. The high wilderness values are considered to outweigh the gas production potential in the proposed wilderness area. Although production may occur in the wilderness on pre-FLPMA leases that are presently suspended. No conflicts exist with other resources or land uses. Wilderness designation would be compatible with the adjacent National Forest management of the existing Box-Death Hollow Wilderness Area established in 1984.	The area not proposed is at the northeast corner and along the southern boundary of the WSA. These areas lack outstanding opportunities for solitude and for primitive recreation. Also, wilderness management in the northeast corner may have future conflict with the adjacent airfield of the town of Boulder.
30	STEEP CREEK	040-061	21,898	20,806	1,090	All of the area is natural. About 75 percent of the area has outstanding opportunities for solitude and 87 percent has outstanding primitive recreation. Special features relate to high scenic values, including several small perennial streams. Uranium may be found in portions of the area, but the potential for recovery is low, and uranium potential exists in many places elsewhere in southern Utah outside of WSAs. Parts of the area may be suitable for elk habitat improvements, but no wildlife projects are planned. Wilderness values are considered to outweigh the potential mineral values and possible future elk habitat improvements. No significant conflicts exist with other land uses.	The area not proposed is on the west side and in a narrow band along the southern edge of the WSA. The westerly area lacks outstanding opportunities for primitive recreation. The narrow strip of land along the southern edge may be in conflict with future transportation and utility needs along the Boulder to Bullfrog Road (Burr Trail). A corridor is required for maintenance and upgrading of the road within the county right-of-way. A nonwilderness corridor along the south edge of the WSA would not significantly affect adjacent wilderness values.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
31	NORTH ESCALANTE CANYON/THE GULCH	ISA	119,300	91,558	27,742	<p>More than 99 percent of the area is natural. About 90 percent of the area has outstanding opportunities for solitude and 97 percent has outstanding opportunities for primitive recreation. Special features include outstanding scenic values, numerous archaeological sites, and a segment of the historic Old Boulder Road. About 11 percent (10,082 acres) was designated as four ONA in 1970. Also included is the Wolverine Petrified Wood Natural Environmental Area. About 22 percent of the proposed area currently is closed to ORV use. Uranium and associated copper may occur in the eastern portion of the area, however, uranium and copper potential exists in many places elsewhere in southern Utah. Wilderness values in the proposed area outweigh mineral considerations. The Escalante River flows through the proposed wilderness. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the Escalante River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. No significant conflicts exist with other resource uses.</p>	<p>All of the area is natural; however, less than 15 percent has outstanding opportunities for solitude or primitive recreation. The areas not proposed are along the perimeter of the WSA. The northern edge of WSA is not proposed in order to retain future options along the Burr Trail road (as noted for the Steep Creek WSA). Lands along the southern boundary, including The V Flat, are lacking in outstanding wilderness qualities.</p>
32	CARCASS CANYON	040-076	46,711	0	46,711	<p>None</p>	<p>All of the area is natural, 57 percent has outstanding solitude and 25 percent has outstanding primitive recreation; however 92 percent of the WSA is within the Kaiparowits KRCRA. Although extraction of this coal is not expected in the short term, the option for long-term future coal mining is significant. Also, uranium may be found in the area and may be recovered in the long term. The mineral potential is considered to outweigh the wilderness values in the area.</p>

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
33	SCORPION	040-082	35,884	14,978	20,906	Essentially all of the area is natural. About 65 percent of the area has outstanding solitude and 76 percent has outstanding opportunities for primitive recreation. Special features include scenic values. Uranium may be found in the area, but the potential for recovery is low, and uranium potential exists in many places elsewhere in southern Utah outside of WSAs. Wilderness values outweigh mineral considerations. No significant conflicts exist with other land uses.	The two areas not proposed do not have outstanding opportunities for solitude and primitive recreation. The scenic values in these areas are not distinctive.
34	ESCALANTE CANYONS TRACT 5	ISA	760	760*	0	All of the area is natural. About 30 percent has outstanding solitude and 4 percent (Coyote Gulch) has outstanding primitive recreation. Special features are the scenic values comprised of sheer canyon walls and a natural arch. The area has wilderness values in conjunction with proposed wilderness in the adjacent Glen Canyon NRA, primarily because the 0.5-mile section of Coyote Gulch in the WSA is an integral portion of the 15-mile hiking route in the GCNRA down the Gulch to the Escalante River. No significant conflicts exist with other uses.	None

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
35	FIFTY MILE MOUNTAIN	040-080	146,143	91,361	54,782	All of the area is natural. About 76 percent has outstanding opportunities for solitude and 73 percent has outstanding primitive recreation. Special features include scenic qualities within the area, panoramic views of the lower Glen Canyon region, and significant archaeological resources. About 15 percent of the area extends along the east edge of the Kaiparowits KRCRA. The area contains less than 0.2 percent of the coal reserves in the Kaiparowits coal field and is insignificant when compared to the available reserves elsewhere in the region. None of the present coal leases in the WSA are in this area. Commercial mining from the coal field is not expected in the short term (prior to the year 2020). Wilderness values are considered to have precedent over the mineral extraction potential in the proposed area. No significant conflicts exist with other resources.	The area not proposed is along the west, north, and east edges of the WSA. All of the area is natural, but lacks outstanding opportunities for solitude and primitive recreation. Nearly all of the mineable coal in the WSA and all 7,505 acres leased for coal, with pre-existing rights are in the area not proposed for wilderness. Although mining is not expected in the short term, the option for future mining in this area is significant. Uranium may be found near Cat Pasture along the east edge of the WSA. In the area the mineral potential outweighs the wilderness values.
A	RED BUTTE	040-147	804	804*	0	All of the area is natural. About 75 percent has outstanding opportunities for solitude and 22 percent has outstanding primitive recreation. Special features include the scenic values which are present in conjunction with proposed adjacent wilderness in Zion National Park. Wilderness protection of the Red Butte area would add to park values. No significant conflicts exist with other land uses.	None
B	SPRING CREEK CANYON	040-148	4,433	1,607*	2,826	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include the scenic values which are present in conjunction with proposed adjacent wilderness in Zion National Park. The southern portion of the WSA is nearly identical to the park in terrain and scenery, and wilderness protection would add to park values. No significant conflicts exist with minerals or other land uses.	The north part of the WSA essentially is separated from the southern part by State and private land. Although it is natural, 62 percent has outstanding solitude and 54 percent has outstanding primitive recreation, the area would not add to park values because of the separated ownership pattern. Wilderness management of the 1,878-acre north area by itself (with only a section corner tie to the southern area) would not be effective.

TABLE 11.3 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHWEST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
C	THE WATCHMAN	040-149	600	600*	0	The area is natural. About 75 percent has outstanding opportunities for solitude and primitive recreation. The area would complement adjacent values in conjunction with proposed wilderness in Zion National Park. It would preserve the natural environment near the park entrance and accommodate a trail for hiking along the Virgin River East Fork (Parunuweap Canyon). No significant conflicts exist with minerals or other land uses.	None
D	TAYLOR CREEK CANYON	040-154	35	35*	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include exceptional scenic values and wildlife (raptors). The area would be suitable for wilderness management in conjunction with proposed wilderness in the adjacent Zion National Park. No significant conflicts exist with minerals or other uses.	None
E	GOOSE CREEK CANYON	040-176	89	89*	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. It has wilderness values in conjunction with adjacent proposed wilderness in Zion National Park. It has high scenic value associated with Zion Canyon. No significant conflicts exist with other resource uses.	None
F	BEARTRAP CANYON	040-177	40	40*	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation, in conjunction with adjacent proposed wilderness in Zion National Park. It has high scenic value with rock forms and hanging gardens. No significant conflicts exist with other resource uses.	None

* These areas are proposed for wilderness designation only in conjunction with proposed wilderness in the adjacent Zion National Park.

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
36	MT. ELLEN-BLUE HILLS	050-238	81,726	65,804	15,922	The proposed area includes extreme landscape diversity, with Mt. Ellen, the Blue Hills badlands, and South Cainville Mesa. The area is the northernmost, and perhaps most prominent, of the Henry Mountains group. All of the area is natural, with outstanding opportunities for solitude on 92 percent and for primitive recreation on 56 percent. Special features are scenic values, geological aspects, ecological diversity (four biological life zones), bison, and bristlecone pine. No conflict exists with minerals, except for low potential coal deposits. About 1,000 acres of potential vegetative treatments for livestock and wildlife would be foregone, but this is believed to be outweighed by wilderness values.	About 99 percent of the area not proposed is natural. It lacks outstanding opportunities for solitude and primitive recreation. Conflicts exist with coal at Wildcat Mesa. Coal extraction at Wildcat Mesa is not expected in the short term, but has potential in the long term.
37	BULL MOUNTAIN	050-242	13,620	11,800	1,820	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features are scenic and geological values. The mountain is a dome-shaped bysmalith formed by igneous intrusion. No significant conflicts exist with other land uses.	The 1,820 acres not proposed are not natural. It is a pre-FLPMA vegetation treatment (chaining) that was inadvertently included in the WSA on the inventory map.

APPENDIX 11
TABLE 11.4 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	WILDERNESS (acres)	PROPOSED ACTION NON-WILDERNESS (acres)	RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
38	DIRTY DEVIL	050-236A	61,000	61,000	0	All of the area is natural with an extensive network of slickrock canyons. About 80 percent has outstanding opportunities for solitude and primitive recreation. Special features include scenic, historical, ecological, geological, and other (petrified wood, beaver colonies) values. The diversity and uniqueness of special features are exceptional. Designation would not preclude future in-situ recovery of the available tar sand in the Tar Sand Triangle Special Tar Sand Area. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the Dirty Devil River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. No significant conflicts exist with other land uses.	None
39	HORSESHOE CANYON (SOUTH)	050-237	38,800	36,000	2,800	All of the area is natural and has outstanding opportunities for solitude. About 79 percent has outstanding primitive recreation. Special features include scenic, historical, ecological, geological, archaeological, and paleontological values. Uranium may be present, but potential for commercial recovery is believed to be low. No conflicts exist with other land uses. Designation would complement values in the adjacent Horseshoe Canyon detached portion of Canyonlands National Park.	The 2,800-acre area lacks solitude and outstanding primitive recreation.

TABLE 11.4 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
40	FRENCH SPRING-HAPPY CANYON	050-236B	25,000	11,110	13,890	The proposed action includes only the area of the canyons. All of the area is natural and nearly all of it has outstanding opportunities for solitude and primitive recreation. Special features are the scenic values of the canyons. Although the area is within the Tar Sand Triangle Special Tar Sand Area, no conflict with minerals is expected because tar sand generally is not present in the canyons, and the 5,530 acres of tar sand in the designated area would remain intact for a buffer along the cliff edges even if the area is not designated wilderness. No significant conflicts exist with other land uses.	The benchland areas adjacent to the canyon rims do not have outstanding opportunities for solitude and primitive recreation. Also, these areas have potential for tar sand extraction by in situ methods, associated with the future development potential of other portions of the Tar Sand Triangle STSA. No development is projected in the short term; however, the long-term potential for recovery of bitumen from tar sand is given precedence over wilderness values.
41	FIDDLER BUTTE	050-241	73,100	32,700	40,400	The proposed action would create two separate wilderness areas: Stair Canyon (27,000 acres) and The Block (5,700 acres). Both areas are all natural. About 72 percent has outstanding solitude and all of both areas have outstanding opportunities for primitive recreation. Special features include very high scenic values, especially from the top of The Block, and archaeological resources. The Dirty Devil River flows through the proposed Stair Canyon area. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the Dirty Devil River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. No conflict with minerals or other land uses exists for Stair Canyon. Tar sand deposits and locatable minerals (uranium, copper, gold, and silver) may occur in the vicinity of The Block; however, likelihood of development in the foreseeable future is low. Wilderness designation would complement the adjacent proposed wilderness in Glen Canyon NRA.	Areas east of the Dirty Devil River and adjacent to the base of The Block, have limited opportunities for solitude and primitive recreation. Also, the potential for conflicts with future tar sand development exists east and north of The Block, within the Tar Sand Triangle STSA. No tar sand extraction is expected to occur in the area in the short term; however, the option for long-term development is considered to outweigh the wilderness values.

APPENDIX 11
TABLE 11.4 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
42	MT. PENNELL	050-248	74,300	25,800	48,500	All of the area is natural. About 69 percent has outstanding solitude and primitive recreation opportunities. Special features include The Horn (rock climbing), outstanding scenic vistas, bison, and ecological diversity (four biological life zones). Little or no conflict with minerals or other land uses would occur. Development on valid mining claims following designation will likely reduce naturalness and the quality of opportunities for solitude on portions of the wilderness.	Outstanding opportunities for solitude and primitive recreation are lacking on Cave Flat and west of Cave Flat. Also, minable coal deposits occur in the north Cave Flat area. Short-term extraction of this coal is unlikely, but the long-term potential is recognized.
43	MT. HILLERS	050-249	20,000	16,360	3,640	All of the area is natural. About 92 percent has outstanding opportunities for solitude and primitive recreation. Special features are scenic values, bristlecone pine, and geologic formations of stocks and laccoliths. Diversity of vegetation, two streams, and three springs provide interest.	The acres not proposed are comprised of six locations at the base of the mountain where outstanding opportunities for solitude and primitive recreation are lacking. Generally, these are areas of pinyon-juniper vegetation typical of the lower elevations of the region.

APPENDIX 11
TABLE 11.4 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
44	LITTLE ROCKIES	050-247	38,700	38,700	0	All of the area is natural, with a labyrinth of canyons, peaks, and topographical diversity. About 72 percent has outstanding opportunities for solitude and primitive recreation. Special features include scenic, historical, ecological (desert bighorn sheep), geological, and archaeological values. Uranium may occur, but the likelihood for development is low. Gold and silver are predicted to occur in the south part of the area; however, the high wilderness values are believed to take precedence. Wilderness would be consistent with the 1975 designation of the area as a National Natural Landmark. Also, it would complement recreation associated with the adjacent Glen Canyon NRA.	None
G	FREMONT GORGE	050-221	2,540	0	2,540	None	The area is natural and has outstanding solitude. It lacks outstanding opportunities for primitive recreation. The area meets wilderness criteria only in conjunction with the adjacent Capitol Reef National Park. The NPS considers it to be a minor buffer addition to the current park boundary. Therefore, it is insignificant in value and contribution to the park, and unsuitable for wilderness designation.

It is the purpose of this report to provide information on the proposed action for the South Central Region. The information is presented in a summary format for the purpose of providing a general overview of the proposed action and its potential impacts. The information is not intended to be a substitute for a detailed study of the proposed action and its potential impacts. The information is presented in a summary format for the purpose of providing a general overview of the proposed action and its potential impacts. The information is not intended to be a substitute for a detailed study of the proposed action and its potential impacts.

APPENDIX 11

TABLE 11.4 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTH CENTRAL REGION

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APPENDIX 11
TABLE 11.5

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)	
45	MANCOS MESA	060-181	51,440	51,440	0	<p>About 90 percent of the area is natural and has outstanding opportunities for solitude and primitive recreation. Abandoned dirt roads and mineral exploration drill pads affecting about 10 percent of the area are expected to become substantially unnoticeable through rehabilitation and through natural processes. Special features include scenic, geologic, archaeological, historical, and wildlife values. Uranium, oil, and gas are predicted to occur in the area, but explorations to date have located no commercial deposits; consequently, wilderness values outweigh mineral potential.</p> <p>None</p>
46	GRAND GULCH COMPLEX	ISA	105,520	105,520	0	<p>The area encompasses the existing Grand Gulch Primitive Area (37,580 acres), and four contiguous tracts: Pine Canyon (10,890 acres), Bullet Canyon (8,520 acres), Shells Flat (3,140 acres), and Slickhorn Canyon (45,390 acres). All of the area is natural. About 98 percent has outstanding opportunities for solitude and all of it has outstanding opportunities for primitive recreation. Special features include scenic, geologic, historical (Oliver Ranch and Hole-in-the-Rock Trail), and archaeological resources. The area has long been well known for its extensive Anasazi Indian ruins and relics. Substantial past exploration for oil and gas, in and adjacent to the area, has resulted in no commercial discoveries. About 47 percent of the area now is closed to oil and gas leasing. There are conflicts with minerals. Approximately 1,660 acres of planned vegetation treatments for livestock would not be allowed but wilderness values are judged to outweigh potential livestock forage.</p> <p>None</p>

APPENDIX 11
TABLE 11.5 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
47	ROAD CANYON	060-021	52,420	52,420	0	All of the area is natural. About 87 percent has outstanding opportunities for solitude and 44 percent has outstanding primitive recreation. Although existing dirt roads to three State sections in the center of the area limit opportunities for primitive recreation, the overall wilderness qualities of the rolling plateaus and deep, winding canyons are significant. Special features include scenic, geologic, historical (Hole-in-the-Rock Trail), and archaeological values. Erosional landforms are of high interest. A high density of Anasazi Indian ruins and relics exist in the area. Limited exploration for oil and gas has resulted in no discoveries; and the potential for any mineral development is considered to be low. Some firewood cutting occurs in the vicinity, but this use fully can be met outside of the WSA. Wilderness values are believed to outweigh possible vegetation treatment for increased livestock forage on 700 acres.	None
48	FISH CREEK CANYON	060-204	46,440	40,160	5,680	All of the area is natural and has outstanding opportunities for primitive recreation. About 97 percent of the area offers outstanding solitude. Special features include scenic, historical (Hole-in-the-Rock Trail and Snow Flat Spring Cave), and archaeological values. Fish, Owl, and McCloyd's Canyons have Anasazi Indian ruins and are popular with visitors. Approximately 2,100 acres of planned vegetation treatment for livestock would not be allowed. No conflict exists with minerals or other land uses.	The area is natural and has outstanding opportunities for primitive recreation; however, 26 percent lacks outstanding opportunities for solitude. Areas along the east side of the WSA are not included in order to provide a logical boundary line.
49	MULE CANYON	060-205B	5,990	5,990	0	All of the area is natural and has outstanding opportunities for primitive recreation. About 87 percent has outstanding solitude. Special features include scenic values and archaeological sites. There are 37 known Anasazi sites in the area, most of which are cliff dwellings. Potential for oil and gas exploration would be foregone. No other significant conflicts exist with minerals or other land uses.	None

APPENDIX 11
TABLE 11.5 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
50	CHEESEBOX CANYON	060-191	15,410	0	15,410	None	Although all of the area is natural and 60 per- cent has outstanding solitude and primitive recreation, it is not proposed due to wilder- ness management problems related to outside sights and sounds. Traffic on about 4 miles of State Highway 95 adjacent to the southern boundary, adversely affects solitude on the mesas over the southern third of the area. No mineral development is expected within the area; however, development is predicted for the mesa adjacent to and above the WSA. The sights and sounds of adjacent activity would detract from wilderness values.
51	DARK CANYON COMPLEX	ISA	68,030	68,030	0	The proposal includes the Dark Canyon Primi- tive Area (62,040 acres) and the adjacent Middle Point and Lean-To Point areas (5,990 acres). All of the proposed area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include Anasazi ruins and relics, fossils, cougar, his- toric cowboy camps and trail, and scenic val- ues of deep canyons, sheer cliffs, and a few natural arches. No conflict exists with miner- als or other resource uses. The primitive area was withdrawn from mining claim location in 1970 and also is closed to mineral leasing. Designation and management of the area as wilderness complements the existing Dark- Woodenshoe Canyon Wilderness to the east on the adjacent Manti-LaSal National Forest and proposed wilderness on north and west on Can- yonlands National Park and Glen Canyon NRA. It links these units to form a wilderness man- agement cluster of 251,230 acres.	None

APPENDIX 11
TABLE 11.5 (Continued)
SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	PROPOSED ACTION			RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
		WSA NUMBER	WSA ACREAGE	WILDERNESS (acres)	NON-WILDERNESS (acres)	
52	BUTLER WASH	060-169	24,190	24,190	0	None
					All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic values, Anasazi and/or Fremont archaeological sites, and remnants of early century cowboy use. The area is used by commercial nature study groups. No conflict exists with minerals or other land uses. Designation is complementary to proposed wilderness in the adjacent Canyonlands National Park.	
53	BRIDGER JACK MESA	060-167	5,290	5,290	0	None
					All of the area is natural and has outstanding opportunities for solitude and primitive recreation. The view from Bridger Jack Mesa is the major special feature. Uranium may be present, but occurs in geologic formations that may be accessed from the base of the mesa, outside the WSA. No conflict exists with minerals or other land uses. Livestock use was terminated in 1970, making the area useful for comparative vegetation studies.	
54	INDIAN CREEK	060-164	6,870	6,870	0	None
					All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include picturesque canyons with two large pour-offs, and Anasazi and/or Fremont archaeological sites. Potash and uranium/vanadium may be present, but the likelihood of extraction is low. No conflict exists with other land uses. Designation is complementary to proposed wilderness in the adjacent Canyonlands National Park.	
55	BEHIND THE ROCKS	060-140A	12,635	12,635	0	None
					All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include striking scenery of sandstone fins unique to the region, four arches, Indian ruins, and a mastodon petroglyph. The area has favorable potential for oil and gas, potash, and uranium/vanadium; however, the unique landscape and wilderness values are believed to outweigh the mineral development potential.	

TABLE 11.5 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
56	MILL CREEK CANYON	060-139A	9,780	9,780	0	All of the area is natural. About 29 percent (primarily the North Fork of Mill Creek) has outstanding opportunities for solitude and primitive recreation. The North Fork is a scenic sandstone canyon with a perennial stream popular with recreation visitors. It is very convenient to people in the city of Moab. Potash, uranium/vanadium, oil, and gas may occur in the area; however, development potential is considered to be low. The high popularity for wilderness recreation tends to weight emphasis toward wilderness designation.	None
57	NEGRO BILL CANYON	060-138	7,620	7,620	0	About 92 percent of the area is natural. About 18 percent has outstanding opportunities for solitude and 30 percent has outstanding primitive recreation. The scenic value of Negro Bill Canyon (a side canyon of the Colorado River) is the main special feature. It has a perennial stream and spectacular sandstone formations of high interest to recreation visitors. Access to the mouth of the canyon is a short drive from the city of Moab. Potash, uranium/vanadium, oil, and gas may occur in the area; however, development potential is considered to be low. The high popularity for wilderness recreation is given precedence over mineral potential.	None

TABLE 11.5 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-SOUTHEAST REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
58	HORSESHOE CANYON (NORTH)	060-045	20,500	20,500	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features are geologic, scenic, historic, archaeological, wildlife, and ecological values. Potash and uranium/vanadium may occur in the area. Additionally, the Green River bordering the area has been identified as part of a potential hydropower site. It is expected that the potash and hydropower have low potential for development. Uranium exploration occurred in the area during the 1950s. Limited uranium development on valid claims is projected following designation, however, an unknown portion would be foregone. Since uranium may be found in similar geologic formations in the region, the amount foregone in the Horseshoe Canyon area would not be significant on a regional basis. Wilderness designation would complement the adjacent unit of Canyonlands National Park which, in conjunction with the Horseshoe Canyon (South) WSA (map ref. no. 39), would create a significant wilderness corridor from Hans Flat to the Green River, a distance of more than 30 miles.	None
H	LOST SPRING CANYON	060-131B	3,880	3,880*	0	All of the area is natural. About 75 percent contains outstanding opportunities for solitude and primitive recreation. The major special feature is the colorful rock formations, which include natural arches, fins, and domes. Potash may exist, the potential for extraction is low. Some oil and gas production may be foregone but the wilderness values are considered to outweigh the mineral potential provided that the area is managed in conjunction with proposed wilderness in the adjacent Arches National Park.	None
J	SOUTH NEEDLES	060-169A	160	160*	0	All of the area is natural. It has outstanding opportunities for solitude and primitive recreation. No significant conflicts exist with other land uses.	None

* These areas are proposed for wilderness designation only in conjunction with proposed wilderness in adjacent National Parks.

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
59	SAN RAFAEL REEF	060-029A	59,170	59,170	0	All of the area is natural and has outstanding opportunities for primitive recreation. About 99 percent of the area has outstanding solitude. Special features include scenic, historic, and geologic values. The sawtooth ridge of sandstone is a unique landform. Uranium exploration has occurred in the area in the past. Uranium resources exist and may have long-term future development potential for small mines. However, since uranium may be found in similar geologic formations elsewhere in southern Utah, the San Rafael Reef likely would not be essential to provide for overall future market needs. No significant conflicts exist with other resource uses.	None
60	CRACK CANYON	060-028A	25,335	25,335	0	All of the area is natural and has outstanding opportunities for primitive recreation. More than 99 percent of the area has outstanding solitude. Special features include scenic, geologic, archaeological, and wildlife values. The narrow, incised, twisting canyons are the most notable visitor attraction. Uranium exploration and mining previously has occurred in the vicinity. Uranium may be present in the WSA and may have long-term future development potential. However, since uranium may be found in similar geologic formations in southern Utah, the Crack Canyon area likely would not be essential for future supplies of this material. Wilderness would take precedence over ORV use at Chute Canyon and Wild Horse Wash. Approximately 2.5 miles of Muddy Creek flows along the southwest corner of the WSA. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the Muddy Creek system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. No significant conflicts exist with other resource uses.	None

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
61	MUDDY CREEK	060-007	31,400	31,400	0	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic, geological, ecological (wild horses), and archaeological resources. Muddy Creek, a perennial stream which flows in the area for about 20 miles, is a notable attraction. There is potential for conflicts with developments that would consumptively use water upstream of the WSA on the Muddy Creek system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. Uranium mining has occurred in the past adjacent to the WSA and exploration previously has occurred in the area. Uranium may be present and may have future development potential in the area. However, since uranium may be found in similar geologic formations elsewhere in southern Utah, the Muddy Creek area likely would not be essential to meet future overall market needs. No significant conflicts exist with other resource uses.	None
62	DEVILS CANYON	060-025	9,610	0	9,610	None	About 93 percent of the area is natural, 73 percent has outstanding opportunities for solitude, and 33 percent has outstanding primitive recreation. Solitude and recreation values are limited along some of the benches above Devils Canyon and in places within the canyon due to the sounds generated by traffic on the adjacent Interstate 70. The area's size and narrow shape do not allow visitors to readily avoid this highway influence.

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
63	SIDS MOUNTAIN	060-023	80,530	79,644	894	<p>All of the area is natural and has outstanding opportunities for primitive recreation. About 98 percent of the area has outstanding solitude. Special features are archaeological, historic, scenic, geologic, ecologic, and wildlife values. Also included is habitat for 13 sensitive or endangered plant species. About 18 miles of the San Rafael River flows through the area. The river is of high scenic, recreation, and ecologic interest. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the San Rafael River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. Uranium may occur in the area and may have future development potential. However, since uranium may be found in similar geologic formations elsewhere in southern Utah, the Sids Mountain area likely would not be essential for future overall market needs for this material. Wilderness would take precedence over ORV use in the WSA, except in the Coal Wash and Buckhorn Draw areas which are excluded from the proposal. Additional locations for ORV use are available elsewhere in the region. No conflicts exist with other land uses.</p>	<p>The North and South Forks of Coal Wash and Upper Engle Canyon are not proposed as wilderness in recognition of traditional use as vehicle travel routes. Although this nearly divides the proposed area into two sections, both are sufficiently large to maintain wilderness values. ORV use can be contained in the washes, where evidence of such use would be removed by seasonal runoff. Also, a small area on the south border of the WSA would not be included due to influence of sights and sounds from the adjacent interstate 70. In addition, a small area along Buckhorn Draw would not be included due to low wilderness values and influence of nearby vehicular traffic and recreation use.</p>

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
64	MEXICAN MOUNTAIN	060-054	59,600	46,750	12,850	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features are scenic, geologic, archaeological, historic, ecologic, and wildlife values. The area has a great diversity of surface geology. The Black Box, an incised gorge along the San Rafael River, is a noted feature. About 34 miles of the San Rafael River flows through the area. There is potential for conflicts with developments that would consumptively use water upstream of the WSA on the San Rafael River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. Uranium may occur in the area and may have future development potential. However, since uranium may be found elsewhere in southern Utah, the Mexican Mountain area likely would not be essential for future supplies of this material. About half the area already is closed to ORV use by BLM land use plans. No significant conflicts exist with other land uses.	The area not proposed for wilderness generally is accessible or in proximity to areas used by ORVs. Land adjacent to the existing dirt road from Buckhorn Draw is not proposed as wilderness in order to accommodate existing and future ORV use, as well as camping with vehicle access. This area between the San Rafael Campground and Red Canyon, along Indian Bench to Mexican Bend, and the Prickly Pear Flat area have been used traditionally for vehicle-based recreation. The remaining area from Red Canyon west to Buckhorn Wash is not proposed in order to form a logical wilderness boundary.
65	JACK CANYON	060-068A2	7,500	0	7,500	None	Although about 98 percent is natural, 97 percent has outstanding solitude, and all of it has outstanding opportunities for primitive recreation, the area also has proven reserves for oil and gas production. About 63 percent of the area is within the former Greater Jack Canyon KGS. Several leases in and near the area have unitized to form the Peters Point Unit which is held by production established and ongoing since 1952. The oil and gas potential is given precedence over the wilderness values for this entire area.

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
66	DESOLATION CANYON	060-068A1	290,845	224,850	65,995	<p>All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic values, landscape and ecological diversity, wildlife, river attractions, archaeological sites, and historical interests. Desolation Canyon is a deep gorge displaying features of both redrock canyon country and steep, mountainous terrain. The vast expanse of canyon, benches, and ridges is some of the most rugged and remote land in Utah. Diverse wildlife in the area includes elk, bighorn sheep, black bear, mountain lion, three endangered fish species (in the Green River), bald eagle, and peregrine falcon. A 21-mile way along the Price River and on to the Beckwith Plateau would be cherry-stemmed outside of the wilderness and remain open to vehicle access, but its effect on wilderness values would be limited by topography and vegetation. Water flows in the Green River are influenced by complex circumstances. It is projected that adequate flows to protect wilderness riverine values would be maintained as a result of the separate endangered fish program and by system operation under the Colorado River Compact. The Price River flows through the proposed wilderness. There is potential for conflicts with development that would consumptively use water upstream of the WSA on the Price River system. Because the nature and magnitude of the potential conflicts are uncertain and because the WSA has demonstrated wilderness values as discussed above, wilderness values are given precedence. There is potential for hydroelectric dam construction on this part of the Green River but development is unlikely. Oil and gas may be found in the area; however, the most feasible locations for oil and gas recovery have not been proposed for wilderness. In the proposed area, the wilderness values outweigh the energy and mineral potential. Wilderness would be compatible with existing management of the adjacent Uintah and Ouray Indian Reservation Hill Creek Extension to preserve roadless and natural values. This area along with proposed wilderness in the Floy Canyon, Coal Canyon, Spruce Canyon, and Flume Canyon WSAs to the east would preserve the heart of the Wild Book Cliffs area, extending about 50 miles.</p>	<p>All of the area not proposed is natural and has opportunities for primitive recreation. About 96 percent has outstanding solitude. The areas not proposed are along the west edge and of the WSA. They have a high potential for oil and gas development and the Little Park Wash area is underlain by mineable coal. This is based on proven recoveries in the Peters Point Unit (part of which is in the WSA) and the relative accessibility as compared to the center of the WSA. Overall, the mineral potential is considered to outweigh the wilderness values in the areas not proposed, especially when taking into account the size and qualities of the proposed area.</p>

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
67	TURTLE CANYON	060-067	33,690	27,960	5,730	<p>All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include diverse topography, vegetation and wildlife variety, scenic values, and Fremont archaeological sites. The proposed area includes the rugged divide between Little Park and Range Creek, as well as five major drainages with steep V-shaped canyons. It is ecologically diverse with elevations varying from 4,800 to over 9,300 feet. Approximately 27 million tons of recoverable coal occurs along the western edge of the area, and 310 acres are under lease. Existing leases will likely expire before diligent development and production of coal from the WSA in the long term will likely be foregone. Oil and gas may exist in the area; however, the areas with highest oil and gas potential have not been proposed for wilderness. In the proposed area, the wilderness values outweigh the mineral potential. No significant conflicts exist with other resources or land uses.</p>	<p>Although all of the area not proposed is natural and has outstanding opportunities for solitude and primitive recreation, it also has potential for oil and gas development. The southern portion of the WSA has favorable geologic and terrain conditions for oil and gas development, and mineral/energy considerations are believed to outweigh the wilderness values.</p>

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	PROPOSED ACTION		WILDERNESS (acres)	NON-WILDERNESS (acres)	RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
		WSA NUMBER	WSA ACREAGE				
688	FLOY CANYON	060-068B	72,605	23,140	49,465	The proposed area is the northern third of the WSA and has the very rugged landform characteristic of the upper part of the Book Cliffs and Roan Cliffs. All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic, geologic, wildlife, historical, and archaeological values. The northeast part of the area borders, and would be compatible with, the Utah and Ouray Indian Reservation Hill Creek Extension that is managed to preserve roadless, primitive natural values. This area along with the proposed wilderness in Desolation Canyon WSA to the west and Coal Canyon, Flume Canyon, and Spruce Canyon WSAs to the east, would preserve the heart of the Wild Book Cliffs areas, extending for about 50 miles. Oil and gas deposits may occur in the area; however, the rugged terrain severely constrains access, and other locations in the vicinity (including the south part of the WSA) are considered more feasible. No significant conflicts exist with other minerals or land uses.	All of the area is natural and has outstanding opportunities for primitive recreation, and 73 percent has outstanding solitude. Fifty-two percent of the area is within a KRCRA as part of the Sego coal field. Mining of this coal is not projected, but may have long-term potential. Also, oil and gas may be found in the area, most accessible from the south. The mineral/energy potential outweighs the wilderness considerations in the southern two-thirds of the WSA.

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
69	COAL CANYON (Cottonwood Point)	060-100C2	61,430	20,774	40,656	<p>The proposed area is the northern third of the WSA and has the very rugged landform characteristic of the upper part of the Book Cliffs and Roan Cliffs. All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic, ecological, wildlife, and possible archeological values. This area along with the proposed wilderness in Desolation Canyon WSA and Floy Canyon WSA to the west, and in the Spruce Canyon WSA and Flume Canyon WSA to the east, would preserve the heart of the wild Book Cliffs area, extending for approximately 50 miles. This would complement wildland management with the adjacent State roadless area to the north and with the Uintah and Ouray Indian Reservation Hill Creek Extension. Oil and gas deposits may occur in the area; however, the rugged terrain severely constrains access, and other locations in the vicinity (including the south part of the WSA) are considered more feasible. No significant conflicts exist with other minerals or land uses.</p>	<p>All of the area is natural and has outstanding opportunities for solitude and primitive recreation; however, it also has high potential for mineral/energy development. About 42 percent of the area is within a KRCRA as part of the Sego coal field. Coal mining is not projected, but may have long-term potential. Also, oil and gas may occur in the area (1,275 acres are under existing unit agreements and held by production). Coal Canyon, Nash Wash, and Sagers Canyon would not be managed as wilderness. The mineral/energy potential outweighs the wilderness considerations in the south and southeastern two-thirds of the WSA.</p>

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
70	SPRUCE CANYON	060-100C1	20,350	6	14,73	5,614	Although all of the eastern part of the WSA is natural and has outstanding opportunities for solitude and primitive recreation, it also has potential for feasible recovery of oil and gas. The area is part of a former KGS and is relatively accessible. The oil and gas potential is considered to outweigh wilderness management for the eastern one-fourth of the WSA.
						All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic, ecological, wildlife, and possible archaeological values. The area is contiguous to, and would complement the management of, a 56,800-acre tract of State land established as a roadless area in 1975. The area has the very rugged characteristic of the upper part of the Book Cliffs and the Roan Cliffs. This area along with the proposed wilderness in the Desolation Canyon, Floy Canyon, and Coal Canyon WSAs to the west and Flume Canyon WSA to the east, would preserve the heart of the Wild Book Cliffs area, extending for about 50 miles. Coal may exist in the western portion of the area, but development is not projected in the foreseeable future. Any mining of this coal would be in the distant future and only after production of more accessible coal in the vicinity. Oil and gas deposits may occur in the area; however, the very rugged terrain severely constrains access, and other locations in the vicinity (including the eastern part of the WSA) are considered more feasible. No significant conflicts exist with other minerals or land uses.	

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
71	FLUME CANYON (Westwater Point)	060-100B	50,800	16,495	34,305	All of the area is natural and has outstanding opportunities for solitude and primitive recreation. Special features include scenic, ecological, wildlife, and possible archaeological values. The west edge of the area is contiguous to, and would complement the management of, the State roadless area. The area has the very rugged characteristic of the upper part of the Book Cliffs and the Roan Cliffs. This area along with the proposed wilderness in the Desolation Canyon, Floy Canyon, Coal Canyon, and Spruce Canyon WSAs to the west, would preserve the heart of the Book Cliffs area, extending for about 50 miles. Oil and gas deposits may occur in the area; however, the very rugged terrain severely constrains access, and other locations in the vicinity (including the southeastern two-thirds of the WSA) are considered more feasible. No significant conflicts exist with other minerals or land uses.	Although all of the southeastern part of the WSA is natural and has outstanding opportunities for solitude and primitive recreation, it also has potential for feasible recovery of oil and gas. Portions of three former KGS occur in the area. Also, about 82 percent of the area is held by production on existing leases, although the producing wells are outside of the WSA. The oil and gas potential outweighs the wilderness considerations in the southeastern two-thirds of the WSA.
72	WESTWATER CANYON	060-118	31,160	26,000	5,160	All of the area is natural and 79 percent has outstanding opportunities for solitude and 30 percent has outstanding primitive recreation. The major recreation attraction is the river corridor, with river running and related camping and hiking. Special features include scenic values and geologic aspects, primarily associated with the river canyon. Mineral conflicts consist of placer gold mining; however economic quantities of gold do not exist in the WSA due to limited gravel deposits. Water flows in the Colorado River are influenced by upstream and downstream use requirements under the terms of the Colorado River Compact. Downstream obligations are sufficient to assure that flows in the Westwater area would maintain wilderness values. No significant conflicts exist with other minerals or land uses in the area.	The area is natural but lacks outstanding opportunities for solitude and primitive recreation. Terrain and vegetation are common to the vicinity, and there is little to attract visitor interest.

TABLE 11.6 (Continued)

SUMMARY OF RATIONALE FOR THE PROPOSED ACTION-EAST CENTRAL REGION

MAP REF. #	WILDERNESS STUDY AREA	WSA NUMBER	WSA ACREAGE	PROPOSED ACTION		RATIONALE FOR AREA PROPOSED AS SUITABLE FOR WILDERNESS DESIGNATION	RATIONALE FOR AREA PROPOSED AS NOT SUITABLE FOR WILDERNESS DESIGNATION
				WILDERNESS (acres)	NON-WILDERNESS (acres)		
73	WINTER RIDGE	080-730	42,462	0	42,462	None	About 84 percent of the area is natural and 75 percent has outstanding opportunities for solitude; however none of it has outstanding primitive recreation. About 70 percent of the area has oil and gas leases held by production (including 14 gas wells, 19 miles of service roads, and 7.6 miles of pipeline placed in the area under pre-existing lease rights). The oil and gas resources take precedence over wilderness values and naturalness has been lost in portions of the area because of the development of the leases as valid rights.
1	DANIELS CANYON	080-414	2,496	0	2,496	None	All of the area is natural and has outstanding solitude; however, none of it is considered to have outstanding primitive recreation. Because of size, the area would need to be managed in conjunction with proposed wilderness in the adjacent Dinosaur National Monument; however, the terrain along the 0.5-mile common boundary does not lend itself to an effective management intertie. A suitable physical tie between the WSA and the National Monument would involve 640 acres of State land and 320 acres of private land. Wilderness designation of the WSA by itself would not add significantly to the proposed wilderness resource of Dinosaur National Monument.

APPENDIX 12

CITIZEN ALTERNATIVES

Table 12.1
COMPARISON OF BLM PROPOSED ACTION AND ALTERNATIVES
PROPOSED BY TWO ENVIRONMENTAL GROUPS (UWA AND UWC)

Name of Area	Area of BLM WSA ^a (acres)	BLM Proposed Action ^b	Utah Wilder- ness Associa- tion (UWA)	Utah Wilder- ness Coali- tion (UWC)
Arch Canyon	0	0	7,680	8,800
Bear Trap Canyon (c)	40	40	40	40
Beaver Creek	0	0	0	25,500
Beaver Dam Wash	0	0	0	38,221
Behind the Rocks	12,635	12,635	14,000	20,000
Behind the Rocks West	0	0	5,000	3,800
Big Hollow	0	0	3,593	3,593
Black Ridge	0	0	0	12,500
Black Ridge Canyons West ^d	5,100	0	0	5,100
Bookcliffs ISA (e)	400	0	0	0
Box Canyon	0	0	0	1,900
Bull Canyon (d)	520(d)	0	0	750
Bull Frog Creek	0	0	0	21,000
Bull Mountain	13,620	11,800	11,800	17,870
Burning Hills	61,550	0	61,000	60,000
Butler Wash	24,190	24,190	24,690	25,780
Canaan Mountain	47,170	33,800	47,000	62,400
Carcass Canyon/Devils Garden (e)	47,351	0	59,000	52,000
Cave Point	0	0	0	5,142
Cedar Mountain	0	0	0	13,700
Cedar Mountains	50,500	0	55,000	55,000
Cheese Box/Deer Canyon	15,410	0	23,290	25,000
Coal Canyon	61,430	20,774	65,000	61,000
Colt Mesa (Upper Moody)	0	0	20,500	24,000
Comb Ridge	0	0	0	14,460
Conger Mountain	20,400	0	19,760	19,760
Cottonwood Canyon	11,330	9,853	11,000	11,000
Cougar Canyon/Doc's Pass	15,968	6,408	17,528	28,600
Crack Canyon/Muddy Creek	56,735(c)	56,735	113,000	215,000
Cross Canyon (d)	1,000	0	0	1,100
Daniels Canyon	2,496	0	8,000	5,000
Dark Canyon Complex	68,030	68,030	83,030	119,300
Death Ridge	62,870	0	62,870	56,000
Deep Creek (c)	3,320	3,320	7,070	7,070
Deep Creek Mountains	68,910	57,384	76,000	76,000
Desolation/Jack/Floy Canyons	370,950	247,990	420,000	362,000
Devils Canyon/Link Flute	10,522	0	0	20,000
Diamond Breaks (d)	3,900	0	0	4,200
Dirty Devil/French Springs	86,000	72,110	92,000	169,800
Dog Water Creek	0	0	0	3,600
Dugway Mountains	0	0	18,000	18,000
East of Bryce	0	0	887	887
Escalante Canyon Tract 1 (e)	360	0	0	0
Escalante Canyon Tract 5	760	760	760	4,400
Fiddler Butte	73,100	32,700	87,000	85,000
Fifty Mile Bench	0	0	0	12,712
Fifty Mile Mountain	146,143	91,361	146,000	146,000
Fish Creek Canyon (Owl Canyon)	46,440	40,160	55,500	65,000
Fish Springs	52,500	33,840	45,000	45,000
Fisher Towers	0	0	0	13,300
Flume Canyon	50,800	16,495	60,000	50,000
Fortnocker Canyon	0	0	7,680	7,680
Fortymile Gulch/Dance Hall Rock	0	0	0	640
Fremont Gorge	2,540	0	11,500	18,000
Goldbar Canyon	0	0	0	8,790
Goose Creek Canyon (c)	89	89	89	89
Goose Neck	0	0	4,400	10,200
Grand Gulch Complex	105,520	105,520	131,120	136,120

APPENDIX 12: CITIZEN ALTERNATIVES

Table 12.1 (Continued)
COMPARISON OF BLM PROPOSED ACTION AND ALTERNATIVES
PROPOSED BY TWO ENVIRONMENTAL GROUPS (UWA AND UWC)

Name of Area	Area of BLM WSA ^a (acres)	BLM Proposed Action ^b	Utah Wilder- ness Associa- tion (UWA)	Utah Wilder- ness Coali- tion (UWC)
Granite Creek	0	0	0	11,000
Granite Peak	0	0	9,600	9,600
Gravel and Long Canyons	0	0	0	37,200
Harmony Flat	0	0	9,400	10,470
Harts Point	0	0	0	42,000
Hatch Wash	0	0	0	13,800
Hindu Country	0	0	0	20,490
Horse Spring Canyon	0	0	30,000	31,500
Horseshoe Canyon (South)	38,800	36,000	39,000	52,020
Howell Peak	24,800	14,800	14,800	14,800
Indian Creek	6,870	6,870	21,000	26,920
Jones Bench	0	0	0	2,900
Joshua Tree Natural Area (e)	104	0	11,000	13,500
Kanab Creek	0	0	0	25,750
King Top	84,770	0	55,000	55,000
Labyrinth Canyon/Horseshoe Canyon (North) (f)	20,500	20,500	42,000	83,400
Lamp Stand	0	0	0	2,000
LaVerkin Creek Canyon (c)	567	567	567	567
Limestone Cliffs	0	0	0	21,300
Little Egypt - Allen Dump	0	0	0	13,120
Little Goosecreek	0	0	0	1,330
Little Rockies	38,700	38,700	52,000	60,070
Long Canyon	0	0	12,000	14,000
Lost Spring Canyon (c)	3,880	3,880	6,760	11,600
Mancos Mesa	51,440	51,440	46,120	108,700
Mexican Mountain	59,600	46,750	74,000	65,000
Mill Creek Canyon	9,780	9,780	10,000	14,570
Moonshine Draw	0	0	0	4,800
Moquith Mountain	14,830	0	14,830	14,830
Mt. Elfen-Blue Hills	81,726	65,804	97,000	128,350
Mt. Hillers	20,000	16,360	21,000	18,770
Mt. Pennell	74,300	25,800	99,000	143,125
Mud Spring Canyon	38,075	0	51,000	62,000
Mule Canyon	5,990	5,990	5,990	5,990
Mussentuchit Badlands	0	0	0	22,400
Negro Bill Canyon	7,620	7,620	8,000	13,500
Newfoundland Mountains	0	0	23,266	23,266
Nipple Bench	0	0	0	30,000
Nokal Dome/Mikes/Lake Canyon	0	0	80,000	80,000
North Escalante/The Gulch	119,752	91,558	124,400	125,000
North Fork Virgin River (c)	1,040	1,040	1,040	1,040
North Stansbury Mountains	10,480	10,480	10,480	10,480
Notch Peak	51,130	28,000	40,000	40,000
Notom Bench	0	0	0	8,975
Nutters Hole	0	0	0	62,000
Orderville Canyon (c)	1,750	1,750	1,750	1,750
Paria-Hackberry	136,222	95,042	136,000	158,750
Parunuweap Canyon	30,800	17,888	30,800	30,800
Phipps-Death Hollow	42,731	39,256	43,000	43,000
Ragged Mountain	0	0	0	28,000
Red Butte (c)	804	804	804	804
Red Desert	0	0	0	28,800
Red Mountain	18,290	12,842	18,000	18,000
Road Canyon	52,420	52,420	60,000	52,000
Rockwell	9,150	0	0	11,000

APPENDIX 12: CITIZEN ALTERNATIVES

Table 12.1 (Continued)
COMPARISON OF BLM PROPOSED ACTION AND ALTERNATIVES
PROPOSED BY TWO ENVIRONMENTAL GROUPS (UWA AND UWC)

Name of Area	Area of BLM WSA ^a (acres)	BLM Proposed Action ^b	Utah Wilder- ness Associa- tion (UWA)	Utah Wilder- ness Coali- tion (UWC)
San Rafael Reef	59,170	59,170	80,000	80,000
Scorpion	35,884	14,978	35,400	38,380
Shaffer Canyon	0	0	0	2,800
Sheep Canyon	0	0	0	4,500
Shunesburg	0	0	0	80
Sids Mountain	80,970	80,084	85,000	90,000
Silver Island Mountains	0	0	20,000	20,000
Six Shooter/Bridger Jack Mesa	5,290	5,290	18,000	32,640
Smokey Hollow	0	0	0	11,600
South Needles	160	160	0(g)	0(g)
Spring Creek Canyon (c)	4,433	1,607	4,433	4,433
Spruce Canyon	20,350	14,736	21,000	20,350
Squaw and Papoose Canyon (d)	6,580	0	0	3,090
Squaw and Willis Creek	0	0	0	21,000
Steep Creek	21,896	20,806	20,000	21,900
Swasey Mountain	49,500	34,376	46,000	46,000
Taylor Creek (c)	35	35	35	35
The Blues	19,030	0	19,030	20,000
The Cockscomb	10,080	5,100	10,080	11,070
The Watchman (c)	600	600	160	600
Turtle Canyon	33,690	27,960	34,000	33,800
Upper Muddy Creek	0	0	0	16,600
Wah Wah Mountains	42,140	36,382	45,000	45,000
Wah Wah Central	0	0	37,238	37,238
Wahweap and Coyote Creek	134,400	0	134,000	151,240
West Cold Springs (d)	3,200	0	0	3,400
Westwater Canyon	31,160	26,000	32,000	31,160
White Canyon	0	0	0	20,500
White River	0	0	10,000	12,000
White Rock Range (d)	3,820	0	0	3,700
Wild Horse Mesa	0	0	0	48,700
Winter Ridge	<u>42,462</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Acres	3,263,306	1,975,219	3,865,970	5,040,367

(a) WSA acres studied in Final EIS.

(b) BLM Proposed Action acres in Final EIS.

(c) Small units suitable for wilderness only in conjunction with adjacent proposed wilderness in National Parks. UWA proposal cites a total of 15,988 acres for 10 Zion Units.

(d) Areas in Utah studied as part of units in adjacent states and reported by Colorado or Nevada BLM. Not included in Utah BLM Statewide EIS or Utah Wilderness Association figure.

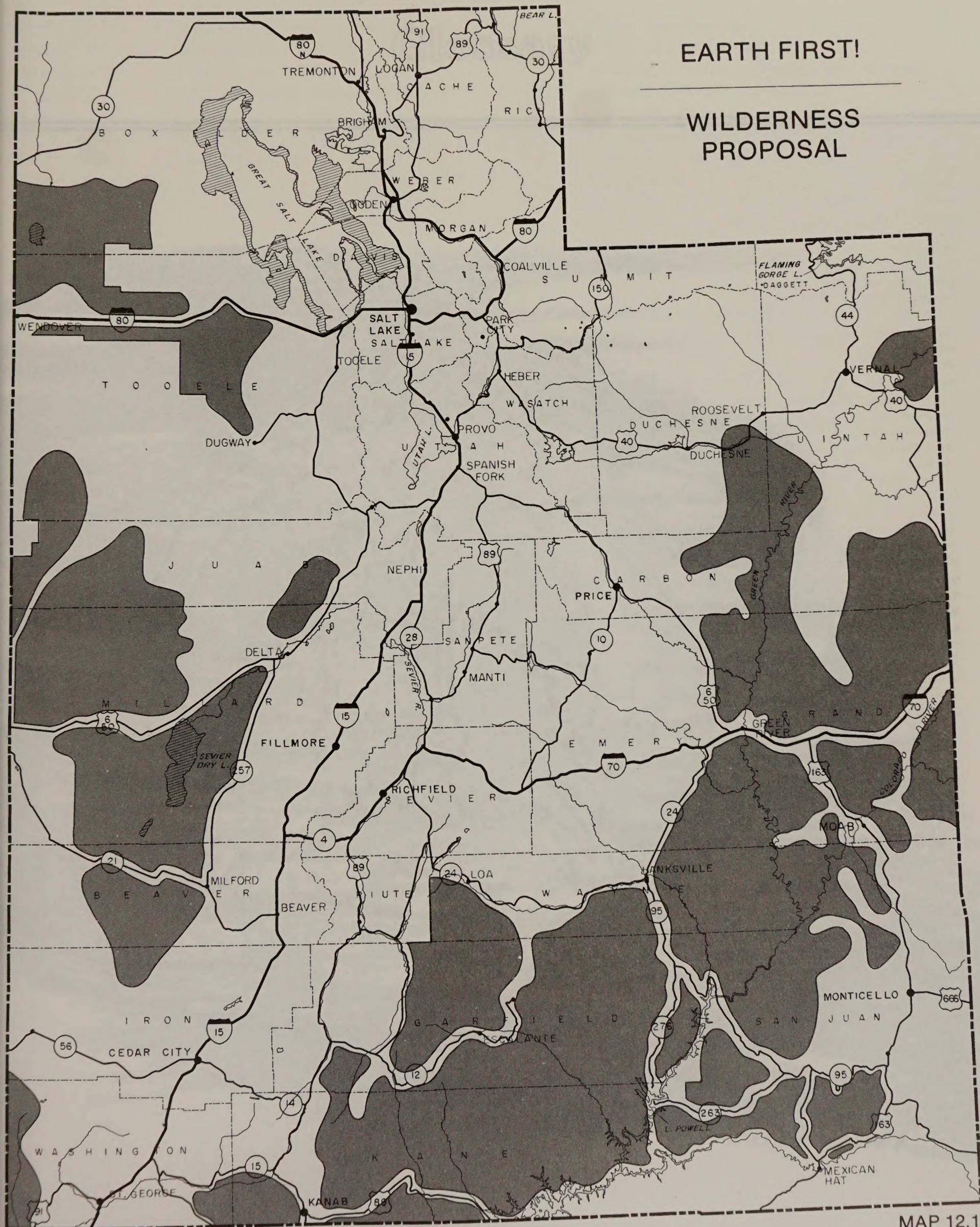
(e) Includes small acreages in ISAs studied and previously reported by BLM and the Secretary of the Interior as unsuitable for wilderness designation.

(f) Labyrinth Canyon refers to the same general area as Ten Mile Canyon and Horseshoe Canyon (North).

(g) included in Butler Wash totals.

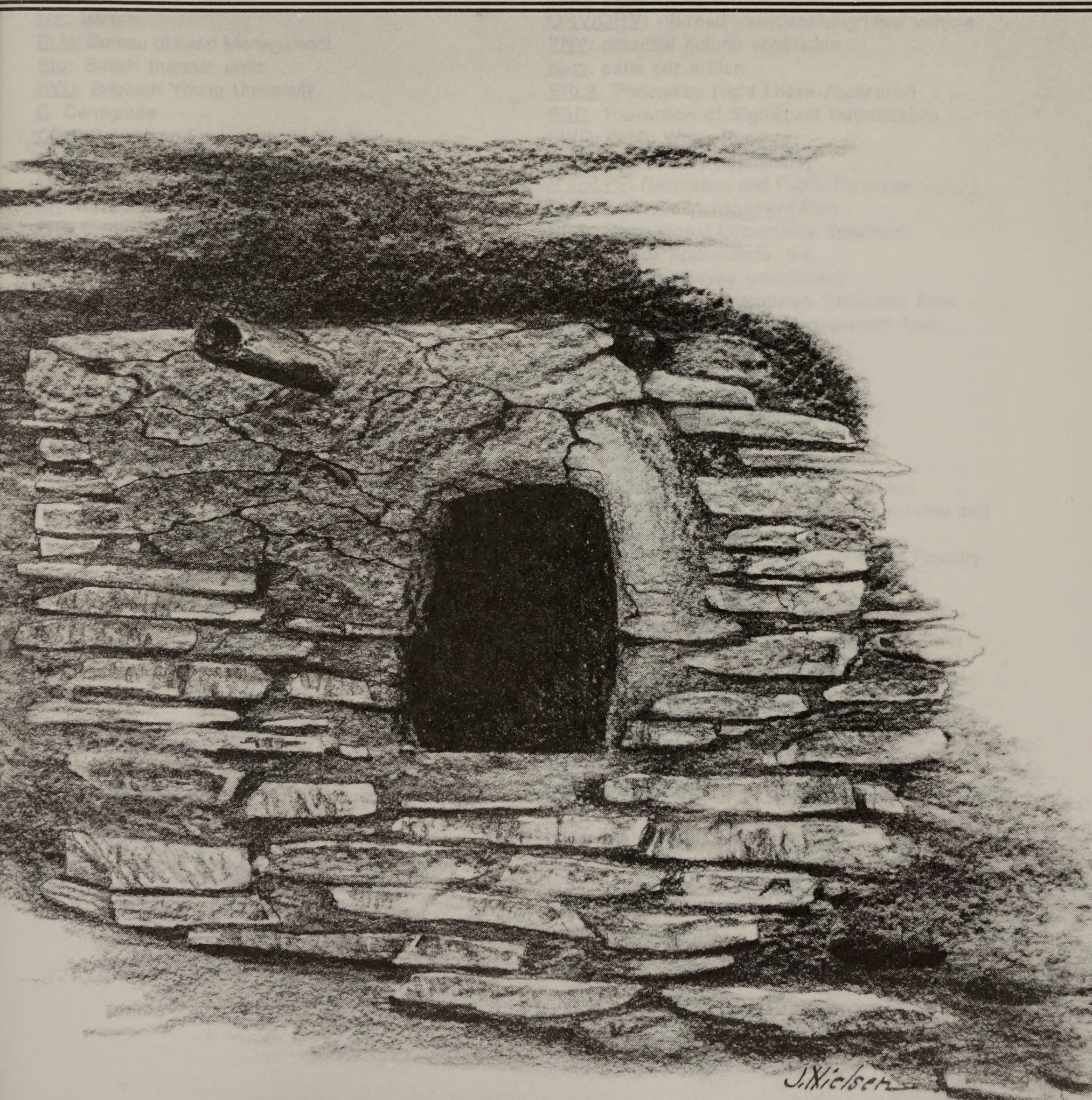
EARTH FIRST!

WILDERNESS
PROPOSAL



MAP 12.1

Glossary



LIST OF ABBREVIATIONS

ACEC: Area of Critical Environmental Concern
AMP: Allotment Management Plan
APD: Application for Permit to Drill
APHIS: Animal and Plant Health Inspection Service
AUM: Animal Unit Month
bb: barrels
BLM: Bureau of Land Management
Btu: British thermal units
BYU: Brigham Young University
C: Centigrade
CEQ: Council on Environmental Quality
CFR: Code of Federal Regulations
cfs: cubic feet per second
EA: Environmental Assessment
EIS: Environmental Impact Statement
EPA: Environmental Protection Agency
F: Fahrenheit
FLPMA: Federal Land Policy and Management Act
FR: Federal Register
FS: Forest Service
FWS: Fish and Wildlife Service
GCNRA: Glen Canyon National Recreation Area
gpm: gallons per minute
HAMOTS: High Accuracy Multiple Object Tracking System (U.S. Air Force)
HMP: Habitat Management Plan
HS: Historic Site
IBLA: Interior Board of Land Appeals
IMP: Interim Management Policy
IPP: Intermountain Power Project
ISA: Instant Study Area
KGS: Known Geologic Structure
KRCRA: Known Recoverable Coal Resource Area
lb: pounds
MBF: one thousand board feet
MCD: Multi-County District
MCF: thousand cubic feet
MFP: Management Framework Plan
mg/l: milligrams per liter
MM: million
MMT: million metric tons
NAAQS: National Ambient Air Quality Standards
NEPA: National Environmental Policy Act
NNL: National Natural Landmark

NPS: National Park Service
NRA: National Recreation Area
NWPS: National Wilderness Preservation System
NWSR: National Wild and Scenic River
ONA: Outstanding Natural Area
ORV/OHV: off-road vehicle/off-highway vehicle
PNV: potential natural vegetation
ppm: parts per million
PRLA: Preference Right Lease Application
PSD: Prevention of Significant Deterioration
PWR: Public Water Reserve
R: Range (survey coordinate)
R and PP: Recreation and Public Purposes
RMP: Resource Management Plan
ROS: Recreational Opportunity Spectrum
SAI: Science Applications, Inc.
sec.: Section (survey coordinate)
SMSA: Standard Metropolitan Statistical Area
SRMA: Special Recreation Management Area
SSA: Site-Specific Analysis
SSF: soil surface factor
STSA: Special Tar Sand Area
T: Township (survey coordinate)
TDS: total dissolved solids
TSP: total suspended particulates
UDOT: Utah Department of Transportation
UDNRE: Utah Department of Natural Resources and Energy
UDSLE: Utah Division of State Lands and Forestry
UDWR: Utah Division of Wildlife Resources
UGMS: Utah Geological and Mineral Survey
USAF: United States Air Force
USBM: United States Bureau of Mines
USDA: United States Department of Agriculture
USDC: United States Department of Commerce
USDI: United States Department of the Interior
USGS: United States Geological Survey
USDoD: United States Department of Defense
USDOE or (DOE): United States Department of Energy
UofU: University of Utah
USU: Utah State University
VRM: Visual Resource Management
WSA: Wilderness Study Area
WSR: Wilderness Study Report

GLOSSARY

ACRE-FOOT. A volume (as of water) that covers an area of 1 acre to a depth of 1 foot (43,560 cubic feet).

AERIAL OVERFLIGHTS. Flights by military, commercial, or private aircraft that pass over a wilderness area; includes fixed-wing and helicopter aircraft; also includes low-level and high-level flight paths.

AERIE. Nest of eagles or other raptors built on a cliff or other high place.

AIR QUALITY. A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances. (Refer also to Prevention of Significant Deterioration [PSD].)

ALLOTMENT (RANGE ALLOTMENT). A management area designated for the use of a prescribed number and kind of livestock under one management plan. An area where one or more livestock permittees graze their livestock, consisting of public lands and any State and private lands that may be enclosed.

ALLOTMENT MANAGEMENT PLAN (AMP). A written program of livestock grazing management including supportive measures, if required. An AMP is designed to attain specific management goals in a grazing allotment and is prepared cooperatively with the permittee(s) or lessee(s).

ALLUVIUM. Material, including clay, silt, sand, gravel, or similar unconsolidated sediments, deposited by a stream or other body of running water.

ALTERNATIVE. One of at least two proposed means of accomplishing planning objectives.

ANALYSIS. The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

ANIMAL UNIT MONTH (AUM). The amount of forage required to sustain the equivalent of 1 cow for 1

month; 6.2 sheep for 1 month; 5.8 deer for 1 month; 9.6 antelope for 1 month; 5.5 bighorn sheep for 1 month; or 2.2 burros for 1 month (usually 800 lb of usable air-dried forage).

ANTICLINE. An upfold of stratified rock in which the beds bend downward in opposite directions from the crest.

AQUATIC. Living or growing in or on the water.

ARCHAEOLOGY. The scientific study of extinct peoples or of past phases of the culture of historic people through skeletal remains, fossils, and objects of human workmanship found in the earth.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; other natural systems or processes; or to protect life/provide safety from natural hazards.

BASE WATERS. Certain water facilities where control and/or ownership determine grazing privileges.

BASIC VISUAL ELEMENTS. The elements which determine how the character of a landscape is perceived. Form: The shape of an object such as landforms or patterns in the landscape. Line: Perceivable linear changes in contrast resulting from abrupt differences in form, color, or texture. Color: The reflected light of different wave lengths that enables the eye to differentiate otherwise identical objects. Texture: The visual result of variation in the surface of an object.

BASIN AND RANGE PHYSIOGRAPHIC PROVINCE. A province in the southwestern United States characterized by a series of tilted fault blocks forming longitudinal ridges or mountains and broad intervening basins.

BLOCKFAULTING. A type of normal faulting in which the crust is divided into structural or fault

GLOSSARY

blocks of different elevations and orientations. It is the process by which block mountains are formed.

BRITISH THERMAL UNITS (Btu). The quantity of heat required to raise the temperature of one avoirdupois pound of water 1 degree Fahrenheit at or near 39.2 degrees Fahrenheit.

CANDIDATE SPECIES. Plant or animal species not yet officially listed but which are undergoing a status review as published in the Federal Register by the U.S. Fish and Wildlife Service. They are candidates for possible addition to the list of threatened and endangered species.

"CHERRY-STEMMED" ROAD. An unofficial term used to describe the way a Wilderness Study Area boundary is drawn to exclude a road that enters the unit; the resulting boundary resembles a cherry-stem.

CLASTIC. Of, belonging to, or being a rock (as a conglomerate or a sandstone) made of fragments of pre-existing rocks.

COMMERCIAL FOREST LANDS. Lands that produce at least 20 cubic feet of forest products per acre per year.

COMMERCIAL SPECIES. Includes all species of softwoods except pinyon-juniper and yew. Hardwoods include aspen and cottonwood.

COMMERCIAL USER DAY. The amount of commercial use within a 24-hour period or any portion thereof. For this analysis, it is assumed that one commercial user day averages one visitor day (12 visitor hours).

CRUCIAL OR CRITICAL WILDLIFE HABITAT. Sensitive use areas necessary to sustain the existence, perpetuation, or introduction of historic or existing high-interest wildlife during critical periods of their life cycles. These areas include Class 1 and 2 water sources (as identified by the Utah Division of Wildlife Resources) and areas essential to the survival of any existing or historic threatened and endangered species. Also, any sensitive or intensive use

area that has little or no reclamation potential to present condition following a disturbance, or those areas where a disturbance would result in an irreversible change to species composition and/or biological productivity of an area.

CUBIC FEET PER SECOND (cfs) (sec. ft.). As a rate of streamflow, a cubic foot of water passing a referenced section in one second of time. One cfs flowing for 24 hours will yield 1,983 acre-feet of water.

CULTURAL RESOURCES. Those resources of historical and archaeological significance.

DIP SLOPE. A slope of the land surface which conforms approximately to the dip of the underlying rocks.

ECONOMIC (MINERALS). Implies that profitable extraction or production under defined investment assumptions has been established, analytically demonstrated, or assumed with reasonable certainty.

ENDANGERED SPECIES. Any animal or plant species in danger of extinction throughout all or a significant portion of its range.

ENVIRONMENT. All that surrounds an organism and interacts with it.

ENVIRONMENTAL ANALYSIS. A systematic process for consideration of environmental factors in land management actions.

EPHEMERAL STREAM. A stream or reach of a stream that flows briefly only in direct response to precipitation in the immediate locality and whose channel is at all times above the water table.

ERODIBILITY. Susceptibility of a soil to erosion by water or wind. Relative terms are none, slight, moderate, and high.

EXCLOSURE. An area fenced to exclude animals.

GLOSSARY

EXISTENCE VALUE. Benefits people derive by simply knowing an area or feature continues to exist in a particular condition.

FORAGE. Vegetation of all forms available and of a type used for animal consumption.

FORB. A broad-leafed herb.

FOREST PRODUCTS. Woodland and forest round wood products such as posts, poles, firewood, and sawlogs.

GAP FENCE. A short fence between two natural barriers used to exclude livestock.

GIGAWATT. A unit of power equal to 1 billion watts.

GRABEN. A block, generally long compared to its width, that has been downthrown along faults relative to the rocks on either side.

GRANDFATHERED USE. Mining and grazing uses and mineral leasing being conducted on October 21, 1976 (the date of approval of the Federal Land Policy and Management Act [FLPMA]) on lands under wilderness review may continue; however, these uses are restricted to the same "manner and degree" as on the date FLPMA was approved. The Secretary is also directed by Section 603(C) of FLPMA to "take any action required to prevent unnecessary or undue degradation of the lands or their resources or to afford environmental protection." This applies to grandfathered uses and all other activities.

GRAZING SYSTEM. Grazing a range allotment having two or more pastures or management units to provide periodic rest for each unit.

HABITAT. A specific set of physical conditions that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

HABITAT MANAGEMENT PLAN (HMP). A plan for a geologic area of public lands which identifies

wildlife habitat management actions to be implemented to achieve specific objectives.

HANGING GARDENS. Small pockets, nick-points, or caves formed along hung water tables on canyon walls, supporting accumulated soil and diverse plant assemblage in drastic contrast to that on nearly arid lands; also, often characterized by water seeps and water-loving plants.

HIGH-PRIORITY HABITAT. Intensive use areas for one or more species of historic or existing high-interest wildlife, including Class 3 water sources (as identified by the Utah Division of Wildlife Resources). Also includes areas where the potential occurrence of endangered species exists (based on unconfirmed reports and professional judgments of wildlife biologists familiar with the area) and areas where documented and legally defensible evidence of the past occurrence of a threatened species is available. Also includes sensitive or intensive use areas where disturbance could result in subsidence, which could interrupt underground aquifers and result in a local loss of groundwater and decreased flows in seeps and springs.

HOMOCLINE. A general term for a rock unit in which the strata have the same dip.

HYPOTHERMAL. Hydrothermal mineral deposit formed at great depth in the temperature range of 300 to 500 degrees Centigrade.

HYPOTHETICAL RESOURCES (MINERALS). Undiscovered resources that are similar to known mineral bodies and that may be reasonably expected to exist in the same producing district or region under analogous geologic conditions. If exploration confirms their existence and reveals enough information about their quality, grade, and quantity, they will be reclassified as identified resources.

HUMAN ENVIRONMENT. All physical aspects of the surroundings of people; includes both natural and man-made features and various combinations thereof.

IDENTIFIED ECONOMIC RESERVE (MINERALS). That portion of the resource from which a usable

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mineral and/or energy commodity can be economically and legally extracted. The term "ore" is also used for reserves of some minerals. There are three subtypes: inferred, indicated, and measured. (1) Inferred: estimates are based on a broad knowledge of the geologic character of the deposit. Few samples or measurements have been obtained; (2) Indicated: estimates of tonnage and grade are computed partly from samples or measurements and partly from projection of existing reserves; and (3) Measured: tonnage and grade are known and are based on extensive drilling and sampling data.

IDENTIFIED SUBECONOMIC RESOURCES (MINERALS). Known valuable deposits not now economically minable. There are two subtypes: (1) Paramarginal: the portion of Identified Subeconomic Resources that borders on being economically producible or is not commercially available solely because of legal or political circumstances; and (2) Submarginal: the portion of Identified Subeconomic Resources that would require a substantially higher price (more than 1.5 times the price at the time of determination) or a major cost-reducing advance in technology.

IMPOUNDMENT. A body of water created by a dam.

IMPROVED WATER. Water sources (springs, wells) that have facilities such as water boxes, pipelines, troughs, pumps, etc., installed to increase water quality, quantity, and availability.

IN-HOLDING. Private or State-owned land inside the boundary of a Wilderness Study Area but excluded from the Wilderness Study Area.

INITIAL INVENTORY. The first step in the BLM wilderness review process. Inventory units or roadless areas that are obviously unsuitable for wilderness are separated from those that warrant intensive inventory for wilderness characteristics.

INSTANT STUDY AREAS. Section 603 of the Federal Land Policy and Management Act mandated that all primitive or natural areas formally identified prior to November 1, 1975, will be studied for wilderness suitability and recommended to the President by July 1, 1980.

INTEGRAL VISTA. A view of a specific landmark or panorama located outside of a Prevention of Significant (PSD) Class I area but perceived from within a mandatory Class I area.

INTENSIVE INVENTORY. The second major step in the BLM wilderness review process. Roadless areas are carefully inventoried for wilderness characteristics. The result of the intensive inventory is the identification of Wilderness Study Areas.

INTERIOR BOARD OF LAND APPEALS (IBLA). The IBLA, as a component of the Department of the Interior Office of Hearings and Appeals, is an authorized representative of the Secretary. The purpose of the IBLA is to hear, consider, and determine as fully and finally as might the Secretary, matters within the jurisdiction of the Department involving appeals from decisions rendered by Departmental officials relating to (1) the use and disposition of public lands and their resources; and (2) the use and disposition of mineral resources in certain acquired lands of the United States. Special procedures for appeals are contained in 43 Code of Federal Regulations, Part 4, Subpart E.

INTERIM MANAGEMENT POLICY (IMP). An interim measure governing lands under wilderness review. This policy protects Wilderness Study Areas from impairment of their suitability as wilderness.

INTERMITTENT STREAM. A stream which flows part of the time, usually after a rainstorm, during wet weather, or only part of the year.

INTRUSION. A feature (landform, vegetation, or structure) that is generally considered out of context because of excessive contrast and disharmony with characteristic landscape.

INTRUSIVE ROCK. A rock that consolidated from magma beneath the surface of the earth.

INVENTORY UNIT. Areas or islands of public land indexed for easy reference at the start of the wilderness inventory. These units may or may not be roadless. A roadless determination requires more detailed field work.

GLOSSARY

KNOWN GEOLOGIC STRUCTURES (KGS). Technically, the known geologic structure of a producing oil or gas field is construed by the Geological Survey to be the trap, whether structural or stratigraphic, in which an accumulation of oil or gas has taken place and the limits of said trap, irrespective of the degree to which it may be occupied by oil or gas. Known geologic structures are frequently much more extensive than the pools of oil or gas they may contain. The extent and place of any oil or gas accumulation therein, though influenced by structure, is finally determined by such factors as stratigraphy, hydrocarbon supply, sand conditions, and hydrostatic pressure. The U.S. Geological Survey seeks to evaluate the net effect of these several factors in terms of reasonably presumptive productive acreage and, as far as practicable, to conform the results, modified to include a fair safety margin, to the subsurface contours of the dominant structural feature involved.

LACCOLITH. A mass of igneous rock intruded between layers of sedimentary rock, causing rock.

LAND TREATMENT. Changing the characteristics of an established vegetation type for the purpose of improving rangeland forage resources. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation by chaining, spraying with herbicides, burning, and plowing, followed by seeding with well adapted desirable plant species.

LAND USE PLAN. A plan that reflects an analysis of activity systems and a carefully studied estimate of future land requirements for expansion, growth control, revitalization or renewal, showing how development in the area should proceed in the future to ensure the best possible physical environment for living, the most economic and environmentally sensitive use of land, and the proper balance in use from a cost-revenue point of view. The land use plan embodies a proposal as to how land should be used in the future, recognizing local objectives and generally accepted principals of health, safety, convenience, economy, and general living amenities.

LEASABLE MINERALS. Refer to Mineral Classifications.

LEASING CATEGORIES. The four categories used to determine leasing activities for oil and gas and tar sand were based on potential for development, other resource uses, and protection of sensitive resource values. Category 1 opens all public lands to leasing with standard stipulations. Category 2 allows leasing with standard and special stipulations to protect sensitive resource values. Category 3 allows leasing with no right of surface occupancy: recovery methods must not disturb the surface. Category 4 closes lands to leasing.

LIFE ZONES. Any series of biogeographic zones into which a continent, region, etc., is divided by latitude and altitude on the basis of the characteristic animal and plant life in a zone.

LIMITED FIRE SUPPRESSION. This is a wildfire suppression action which recognizes that fire suppression in specific areas is: (1) extremely difficult to suppress (hazardous to firefighting personnel or suppression operation including aircraft); or (2) the resource values threatened do not warrant the expense associated with a full suppression action. One or both of these conditions may exist and become the primary objective(s) for a given area. Normally indirect attack is employed utilizing natural barriers, roads, trails, or water features in lieu of costly attack systems applied directly to the fire perimeter.

LIMITED-VALUE HABITAT. Occasional use areas for one or more species of existing high-interest wildlife, including Class 5 or 6 water sources (as identified by the Utah Division of Wildlife Resources). This habitat shows an absence of endangered or threatened wildlife species. Areas include those with a moderate potential (50-percent probability) for reclamation to previous condition and those moderately sensitive habitats and occasional use areas where acceptable mitigation options are definable.

LITHIC. A stone or rock exhibiting modification by humans. It generally applies to projectile points, scrapers, and chips rather than ground stone.

GLOSSARY

LIVESTOCK OR KIND OF LIVESTOCK. The species of domestic livestock: cattle, sheep, horses, burros, and goats.

LIVESTOCK PERMITTEE OR OPERATOR. A person or organization legally permitted to graze livestock on public lands.

LOCATABLE MINERALS. Refer to Mineral Classifications.

MANAGEABLE. In the context of wilderness, manageability refers to legal characteristics of Wilderness Study Areas. Areas with extensive valid existing rights, extensive in-holdings, may not be manageable as wilderness; areas without such factors generally would be manageable.

MANAGEMENT FRAMEWORK PLAN (MFP). A land use plan for public lands administered by BLM which provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource.

MARGINAL RESERVES (MINERALS). That part of the reserve base which, at the time of determination, borders on being economically producible. Its essential characteristic is economic uncertainty. Included are resources that would be producible, given postulated changes in economical or technological factors.

MINERAL CLASSIFICATIONS. Minerals are classified into several broad categories. Leasable mineral resources include oil, gas, tar sand, oil shale, geothermal, and carbon dioxide. Locatable minerals include uranium, gold, silver, copper, and vanadium. Salable resources include sand, gravel, and building stone. Mineral resources were evaluated on the basis of a classification system developed and used by the USDI, Geological Survey and Bureau of Mines.

MODIFIED FIRE SUPPRESSION POLICY. A policy that would allow fire to burn in wilderness areas unless these became large (over 50 acres) and/or would endanger human life or authorized improvements.

MONTANE. Pertaining to mountains.

MULTI-COUNTY DISTRICT. Formal organizations established to join counties in cooperative functions particularly for planning-related activities; similar to an association of governments.

MULTIPLE-USE. Management of public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people. Relative values of the resources are considered, not necessarily the combination of uses that will give the greatest potential economic return or the greatest unit output.

NATIONAL WILDERNESS PRESERVATION SYSTEM (NWPS). A system composed of Federally owned areas designated by Congress as Wilderness Areas. These areas shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness.

NATIONAL WILD AND SCENIC RIVER. A stream segment formally designated as "wild", "scenic", or "recreation" under the provisions of the Wild and Scenic Rivers Act.

NATURALNESS. An area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." (Section 2[c], Wilderness Act).

NON-COMMERCIAL FOREST LANDS. Lands that produce less than 20 cubic feet of forest products per year.

NON-IMPAIRMENT CRITERIA. Guidelines or standards imposed on existing or proposed activities in areas under wilderness review to protect wilderness values. To satisfy the criteria, the activities must not impair the land's suitability for wilderness preservation. General guidelines and guidelines for specific activities are presented in the BLM's "Interim Management Policy and Guidelines for Lands Under Wilderness Review."

GLOSSARY

OFF-ROAD VEHICLE (ORV) OR OFF-HIGHWAY VEHICLE (OHV). Any motorized vehicle designed for or capable of cross-country travel over land, water, sand, snow, ice, marsh, swampland, or other terrain.

OPTION VALUE. A value associated with people who know they can visit an area in the future if they so desire. Also, refers to the concept that a decision is not irreversible and the option to develop at some time in the future is preserved.

OVERBURDEN. Material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal; especially those deposits mined from the surface by open cuts.

OUTSTANDING. Standing out among others of its kind; conspicuous; prominent. Superior to others of its kind; distinguished; excellent.

PALEOGEOMORPHIC TRAP. A stratigraphic trap formed by a buried ancient erosional surface.

PERCHED WATER. A local zone of saturation held above the main body of groundwater by an impermeable layer or stratum, usually clay, and separated from the main body of groundwater by an unsaturated zone.

PERENNIAL STREAM. A stream or portion of a stream that flows continuously.

PERMANENT IMPROVEMENT. A man-made structural or non-structural improvement that will remain at a particular location for more than one field season, as differentiated from temporary structures. Includes such items as toilet buildings, trails, cabins, signs, fences, vegetation manipulations, shelters, and fire grills.

PERMEABILITY (SOIL). The ease with which gasses, liquids, or plant roots penetrate or pass through a layer of soil.

PETROLIFEROUS. Containing or producing petroleum.

PHASE, SOIL. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its use and management. A soil series, for example, may be divided into phases on the basis of differences in slope, stoniness, thickness, or some other characteristic that affects its use and management. These differences are too small to justify separate series.

PHYTOGEOGRAPHIC. The study of the distribution of plants.

PLACER. A place where metal, such as gold, is obtained by washing; an alluvial or glacial deposit, as of sand or gravel, containing particles of gold or other valuable minerals.

PLANNING AREA. One or more planning units for which Management Framework Plans are prepared/revised.

PLANNING AREA ANALYSIS (PAA). The summary of data on social and economic conditions for a planning unit or area.

PLANNING UNIT. A geographic unit within a BLM District that includes related lands, resources, and use pressure problems which are considered together for resource inventory and planning.

POTENTIAL NATURAL VEGETATION (PNV). Vegetation that would exist if plant succession were allowed to reach climax without any human interference. PNV is a particularly important object of research because it reveals the biological potential of all sites.

POUR-OFF. A rock ledge across a drainage bottom where an intermittent stream creates an occasional waterfall.

PREFERENCE RIGHT LEASE APPLICATION (PRLA). Until the early 1970s, the Federal government issued prospecting permits to interested parties to explore coal in areas where economically valuable deposits were not known to exist. By demonstrating that the permit area contained commercially valuable coal, a prospecting permit holder could apply for and

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obtain a lease to mine the deposit. Such lease applications were called Preference Right Lease Applications (PRLAs) and leases were issued without competition. Under the Federal Coal Leasing Amendments Act of 1976, non-competitive coal leases are no longer permitted, subject to valid existing rights.

PRESCRIBED BURN. The use of fire to obtain identified resource management objectives through planned and unplanned ignitions. Prescribed fire requires approved plans written in advance of implementation. Once it is determined that a wildfire is actually within a prescribed fire area and fire behavior and weather conditions are within established parameters and other plan conditions are met, no further suppression action would occur. The management of the fire is guided by prescribed conditions. Management and monitoring of a prescribed fire are required. Should conditions change and existing or predicted weather or fire behavior exceed established parameters, an appropriate suppression action will be taken.

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) CLASSES. Class I is the most restrictive and generally applies to specific national parks and monuments. No decrease in air quality is allowed under this class. Class II areas allow some decrease in air quality.

PRIMITIVE AND UNCONFINED RECREATION. Non-motorized and nondeveloped types of outdoor recreational activities. Each WSA was evaluated for the quality of opportunities for participating in backpacking, camping, dayhiking, fishing, horseback riding, hunting, nature study, photography, rock climbing, rockhounding, cross-country skiing, cultural resources sightseeing, geological sightseeing, wildlife observation, and general sightseeing.

PRIMITIVE RECREATION VALUES. Environmental features that enhance the quality of unconfined, undeveloped, and unmotorized recreation (i.e., hiking, backpacking, cross-country skiing, etc.).

PUBLIC LANDS. Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of the Interior through the

BLM, except lands located on the Outer Continental Shelf and lands held for the benefit of Indians.

PUBLIC PARTICIPATION. The process of attaining citizen input into each stage of development of planning documents. It is required as a major input into the BLM's planning system.

RANGE DEVELOPMENT OR FACILITY. Refer to rangeland improvement.

RANGELAND. Land dominated by vegetation that is useful for grazing and browsing by animals. "Range" and "rangeland" are used interchangeably.

RANGELAND IMPROVEMENTS OR DEVELOPMENTS. Any activity or program on or relating to rangelands that is designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include land treatments (i.e., chaining, seeding, burning, etc.), stockwater developments, fences, and trails.

RANGELAND SURVEY/STUDIES. An inventory of the rangeland resources including production of plant materials, plant composition, rangeland use, physical features, and natural conditions such as water, barriers, etc., for the purpose of estimating ecological conditions, trends in condition, estimated proper stocking rates, etc. These studies are useful in management planning.

RAPTOR. Any predatory bird such as a falcon, hawk, eagle, or owl that has feet with sharp talons or claws adapted for seizing prey and a hooked beak for tearing flesh.

RAPTORS. Birds of prey such as the eagle, hawk, owl, or vulture.

RARE II. The wilderness inventory on lands administered by the Secretary of Agriculture through the United States Forest Service. The acronym stands for Roadless Area Review and Evaluation, and the "II" signifies that it is the second time the Forest Service

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has inventoried and evaluated the lands it administers.

RECREATION AND RESOURCE UTILIZATION ZONE. A management zoning area characterized by maintenance of natural processes while allowing both mining and grazing to the extent possible.

REGION. May be any geographic area larger than a planning area (Social-Economic Profile Area, sub-State, State, multi-State, or National), which is appropriate for comparative area analysis and for which information is available. Regions may be different for different resources or subject matter analysis.

RELICT. A remnant or fragment of a flora that remains from a former period when it was more widely distributed.

RESERVE BASE (MINERALS). That part of an identified resource that meets specified minimum physical and chemical criteria related to current mining and production practices, including those for grade, quality, thickness, and depth. The "reserve base" is the in-place demonstrated (measured plus indicated) resource from which reserves are estimated. It may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics. The "reserve base" includes those resources that are currently economic (reserves), marginally economic (marginal reserves), and some of those that are currently subeconomic (subeconomic resources). The term "geologic reserve" has been applied by others generally to the "reserve-base" category, but it also may include the "inferred-reserve-base" category; it is not a part of this classification system.

RESERVES (MINERALS). That part of the reserve base that could be economically extracted or produced at the time of determination. The term "reserves" need not signify that extraction facilities are in place and operative. Reserves include only recoverable materials; thus, terms such as "extractable reserves" and "recoverable reserves" are redundant and are not a part of this classification system.

RESERVOIR. Refer to stockwatering pond.

RESOURCE AREA. A manageable geographic subdivision of a BLM District.

RESOURCES. All of the products and physical values produced or contained within public lands. They include the values known as natural resources (i.e., timber, coal, oil, etc).

RIGHTS-OF-WAY. An easement or permit that authorizes public land to be used for a specified purpose that generally requires a long, narrow strip of land. Examples are roads, powerlines, pipelines, etc.

RINCON. An entrenched and cut-off meander of a stream that has cut through narrow walls between adjacent loops, leaving abandoned horseshoe-shaped channels and lakes.

RIPARIAN HABITAT. A native environment that supports plants adapted to moist growing conditions along waterways, ponds, etc.

RIPARIAN VEGETATION. Vegetation growing near streams, reservoirs, ponds, etc. (permanent or intermittent). It is usually unique or limited in arid regions and is, therefore, of great importance to a wide variety of wildlife.

ROAD. For the purpose of the BLM's wilderness inventory, the following definition has been adopted from the legislative history of the Federal Land Policy and Management Act:

"The word 'roadless' refers to the absence of roads which have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A trail maintained solely by the passage of vehicles does not constitute a road."

To clarify this definition, the following subdefinitions also apply. "Improved and maintained": Actions taken physically by man to keep a road open to vehicular traffic. "Improved" does not necessarily mean formal construction. "Maintained" does not necessarily mean annual maintenance. "Mechanical means": Use of hand

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or power machinery or tools. "Relatively regular and continuous use": Vehicular use that has occurred and will continue to occur on a relatively regular basis. Examples are access roads for equipment to maintain a stock water tank or other established water sources, access roads to maintained recreation sites or facilities, or access roads to mining claims.

ROADLESS. Refers to the absence of roads that have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A trail maintained solely by the passage of vehicles does not constitute a road.

ROADLESS AREA. That area which is roadless, as defined above, and is bounded by a road, the edge of a right-of-way, other land ownership, or a significant imprint of man.

RURAL ATTAINMENT AREA. A rural area that meets the National Ambient Air Quality standards.

SEDIMENT YIELD. The amount of mineral or organic soil material that is in suspension, is being transported, or has been moved from its site of origin.

SENSITIVE SPECIES. Fish, wildlife, and plants that are candidates for Federal listing or species proposed for Federal listing automatically become sensitive species, according to BLM policy.

SENSITIVE SPECIES. Species not yet officially listed but undergoing status review for listing on the Fish and Wildlife Service's official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

SOCIAL/PSYCHOLOGICAL VALUE. The concept that wilderness provides a condition that could allow an individual to achieve control over stressful conditions, thus contributing to the psychological health of many off-site users.

SOIL ASSOCIATION. A group of defined and named soil units occurring together in individual and characteristic patterns over a geographic region.

SOIL CLASSIFICATION. The systematic arrangement of soils into classes of one or more categories or levels of classification for a specific objective. Broad groupings are made on the basis of general characteristics and subdivisions are made on the basis of more detailed differences in specific properties.

SOIL SURFACE FACTOR (SSF). A numerical expression of surface erosion activity caused by wind and water as reflected by soil movement, surface litter, erosion pavement, pedestalling, rills, flow patterns, and gullies. Values may vary from 0 for no erosion to 100 for severe erosion conditions.

SOIL-VEGETATION INVENTORY. A uniform, systematic method for inventory of soil and vegetation resources and collecting data for use in planning and environmental assessments.

SOLITUDE. Outstanding opportunities for solitude or primitive and unconfined recreation are wilderness characteristics examined in the intensive wilderness inventory. Factors contributing to opportunities for solitude are vegetative screening, topographic relief, vistas, and physiographic variety. 1. The state of being alone or remote from habitations; isolation. 2. A lonely, unfrequented, or secluded place.

SPECIAL FEATURES. An area containing ecological, geological, or other features of scientific, educational, scenic, or historical value.

SPECIAL STATUS SPECIES. Includes the following: (1) proposed species: species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior (A proposed rule has been published in the Federal Register.), (2) threatened/endangered species: species that are officially listed as threatened or endangered by the Secretary of the Interior under the provisions of the ESA (A final rule for the listing has been published in the Federal Register.), (3) candidate species: species designated as candidates (Categories 1 and 2) for listing as threatened or endangered by the FWS/NMFS (A list has been published in the Federal Register.), (4) State listed species: species proposed for listing or listed by a State in a category implying potential

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endangerment or extinction (listing is either by legislation or regulation), and (5) sensitive species: species designated by a State Director, usually in cooperation with the State agency responsible for managing the species as sensitive. (These are species that are: (1) under status review by the FWS/NWFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary; or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats.)

SPECULATIVE RESOURCES (MINERALS). Undiscovered resources that may occur either in known types of deposits in favorable geologic settings where mineral discoveries have not been made or in types of deposits as yet unrecognized for their economic potential. If exploration confirms their existence and reveals enough information about their quantity, grade, and quality, they will be reclassified as identified resources.

SPLIT-ESTATE. Refers to the situation where the subsurface mineral estate is owned or controlled by a party other than the owner of the surface of the same land area.

STANDARD METROPOLITAN STATISTICAL AREA (SMSA). A county containing at least one city or 50,000 inhabitants or more, plus as many adjacent counties that are metropolitan in character and are socially integrated with that central city or cities.

STATE LANDS. Land controlled or administered by one of the individual United States.

STEPPE. Arid land usually characterized as being level and without forests; usually in large tracts and in regions of extreme temperature range and loose soil.

STOCKING. The degree to which an allotment is stocked with livestock and big game, usually expressed in Animal Unit Months.

STOCKWATERING POND OR LIVESTOCK RESERVOIR. A water impoundment made by constructing a

dam or by excavating a dugout or both to provide water for livestock and/or wildlife.

SUBECONOMIC RESOURCES (MINERALS). The part of identified resources that does not meet the economic criteria of reserves and marginal reserves.

SUBSTANTIAL-VALUE HABITAT. Use areas for one or more species of existing high-interest wildlife, including Class 4 water sources (as identified by the Utah Division of Wildlife Resources). These areas show an absence of endangered species; however, potential for occurrence of a threatened species (based on professional judgment of wildlife biologists familiar with the area) may exist. This also includes areas where moderately sensitive habitats on which acceptable permanent mitigation options can be achieved.

SUITABILITY. Used in the context of determining an area's eligibility or non-eligibility for recommendation as wilderness. In the Federal Land Policy and Management Act, suitability means determining whether the area is more suitable for wilderness designation or more suitable for other uses.

SUPPLEMENTAL VALUES. Features of ecological, geological, or other scientific, educational, scenic, or historical value that may be present in an inventory unit. These are not necessary criteria for wilderness suitability, as is stated in the Wilderness Act of 1964, but must be assessed during the intensive wilderness inventory.

TAXA. Any taxonomic unit, as an order, genus, variety, etc.

TEMPORARY STRUCTURE. Any structure that can be readily and completely dismantled and removed for the site between periods of actual use. It may or may not be authorized at the same site from season to season or from year to year.

THREATENED SPECIES. Any animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

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TOTAL DISSOLVED SOLIDS (TDS). The total quantity (milligrams per liter) of dissolved materials in water.

TRADITIONAL TRAVEL ROUTES. Recreational travel behavior inherited over time through social contacts and relationships.

TRADITIONAL USE. Use (e.g., wood cutting, ORV) of an area that has occurred before 1976.

UNALLOTTED FEDERAL LAND. Federal land that currently is not committed to livestock grazing use.

UNCONFINED RECREATION. Recreation occurring in open country without developed facilities; where the visitor may be free to wander over a large expanse of land, and where the visitor may explore unimpeded, except by natural features.

UNDERSTORY. The plants growing beneath the canopy of other plants.

UNDISCOVERED RESOURCES (MINERALS). Resources, the existence of which are only postulated, comprising deposits that are separate from identified resources. Undiscovered resources may be postulated in deposits of such grade and physical location as to render them economic, marginally economic, or sub-economic. To reflect varying degrees of geologic certainty, undiscovered resources may be divided into two parts: hypothetical and speculative resources.

UNIT RESOURCE ANALYSIS (URA). A compilation of physical resource data and an analysis of the current use, production, condition, and trend of the resource and the potentials and opportunities within a planning unit or area, including a profile of ecological values.

UNNECESSARY OR UNDUE DEGRADATION. Surface disturbance greater than what would normally result when an activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, including those resources and uses outside the area of operations. Failure to initiate

and complete reasonable mitigation measures, including reclamation of disturbed areas or creation of a nuisance, may constitute unnecessary or undue degradation. Failure to comply with applicable environmental protection statutes and regulations thereunder will constitute unnecessary or undue degradation.

VISIBILITY. The greatest distance in a given direction where it is possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon.

VISITOR DAY. Twelve visitor hours which may be aggregated by one or more persons in single or multiple visits.

VISITOR USE. Visitor use of the wilderness resource for inspiration, stimulation, solitude, relaxation, education, pleasure, or satisfaction.

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES. Management classes are determined on the basis of overall scenic quality, distance from travel routes, and sensitivity to change. Class I: Provides primarily for natural ecological changes only. It is applied to wilderness areas, some natural areas, and similar situations where management activities are to be restricted. Class II: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character. Class III: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character. Class IV: Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape. Class V: Change is needed. This class applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed to bring it back into character with the surrounding landscape.

VOLATILE ORGANIC COMPOUNDS (VOC). Hydrocarbon emissions that react in the presence of sunlight to produce ozone.

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VUG. A term used in petroleum geology for any opening in a rock, from the size of a small pea upwards. See also vuggy porosity.

VUGGY POROSITY. In petroleum geology, porosity induced by the presence of vugs (oil); it is usually used with reference to limestones.

WAY. A track or path traversed in going from one place to another. In most WSAs, ways originated from vehicles traversing off-road areas.

WETLANDS. Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds.

WILDCAT. An exploratory well drilled for oil and gas on a geologic feature not yet proven productive.

WILDERNESS. An area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation.

WILDERNESS AREA. An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to "the public purposes of recreation, scenic, scientific, educational, conservation, and historical use."

WILDERNESS MANAGEMENT POLICY. The BLM policy that governs administration of public lands designated as Wilderness Areas by Congress. It is based on the mandate of Congress as contained in the Wilderness Act of 1964 and the Federal Land Policy and Management Act (FLPMA) of 1976. FLPMA requires a Wilderness Area to be a roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) of the Wilderness Act.

WILDERNESS REVIEW. The term used in reference to the entire wilderness identification and recommendation process. It includes the wilderness inventory,

study, and reporting phases of the BLM wilderness program.

WILDERNESS STUDY AREA (WSA). Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System (NWPS).

WILDERNESS STUDY REPORT. Reports containing wilderness recommendation on the suitability of Wilderness Study Areas for inclusion in the NWPS. These reports contain rationale for the recommendation and are transmitted to the Secretary of the Interior, the President, and Congress.

WILDERNESS VALUES. Values in three broad categories: (1) naturalness (appears to have been affected primarily by the forces of nature with the imprints of man's work substantially unnoticeable); (2) outstanding opportunities for solitude or a primitive and unconfined type of recreation; and (3) special features.

WITHDRAWAL. An action that restricts the use of public land and segregates the land from some or all of the public land or mineral laws.

WOODLAND. Forest lands producing crops of wood-related material from noncommercial species (i.e., pinyon, juniper, mountain mahogany, etc.).

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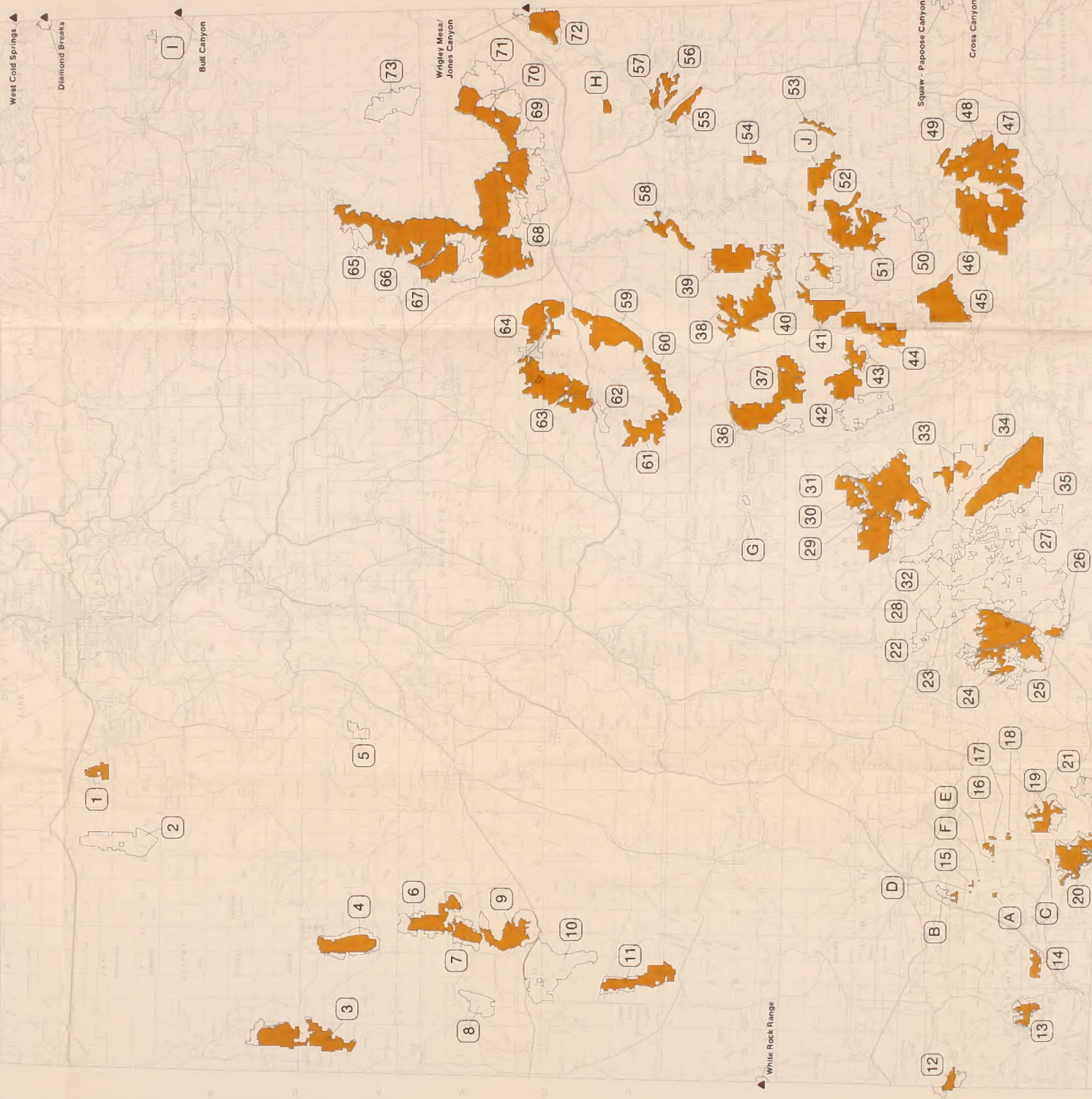
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Final



POCKET MAP 1 - BLM PROPOSED ACTION

- BLM WSAs or Portions of WSAs that would be Designated Wilderness with this Alternative
- BLM WSAs or Portions of WSAs that would NOT be Designated Wilderness with this Alternative
- BLM WSAs Under Study by Adjacent State



INDEX TO MAP REFERENCE NUMBER/LETTER

- 1. North Boundary Mountains WSA
- 2. Deep Creek WSA
- 3. North Fork Virgin River WSA
- 4. Fair Springs WSA
- 5. Panguitch WSA
- 6. Swain Mountain WSA
- 7. Howell Peak WSA
- 8. Cooper Mountain WSA
- 9. King Top WSA
- 10. White Mountain WSA
- 11. West Mountain WSA
- 12. Cottonwood Canyon WSA
- 13. Red Mountain WSA
- 14. Layton Creek Canyon WSA

- 15. Deep Creek WSA
- 16. North Fork Virgin River WSA
- 17. Panguitch WSA
- 18. Swain Mountain WSA
- 19. Howell Peak WSA
- 20. Cooper Mountain WSA
- 21. King Top WSA
- 22. White Mountain WSA
- 23. West Mountain WSA
- 24. Cottonwood Canyon WSA
- 25. Red Mountain WSA
- 26. Layton Creek Canyon WSA

- 27. Deep Creek WSA
- 28. North Fork Virgin River WSA
- 29. Panguitch WSA
- 30. Swain Mountain WSA
- 31. Howell Peak WSA
- 32. Cooper Mountain WSA
- 33. King Top WSA
- 34. White Mountain WSA
- 35. West Mountain WSA
- 36. Cottonwood Canyon WSA
- 37. Red Mountain WSA
- 38. Layton Creek Canyon WSA

- 39. Deep Creek WSA
- 40. North Fork Virgin River WSA
- 41. Panguitch WSA
- 42. Swain Mountain WSA
- 43. Howell Peak WSA
- 44. Cooper Mountain WSA
- 45. King Top WSA
- 46. White Mountain WSA
- 47. West Mountain WSA
- 48. Cottonwood Canyon WSA
- 49. Red Mountain WSA
- 50. Layton Creek Canyon WSA

- 51. Deep Creek WSA
- 52. North Fork Virgin River WSA
- 53. Panguitch WSA
- 54. Swain Mountain WSA
- 55. Howell Peak WSA
- 56. Cooper Mountain WSA
- 57. King Top WSA
- 58. White Mountain WSA
- 59. West Mountain WSA
- 60. Cottonwood Canyon WSA
- 61. Red Mountain WSA
- 62. Layton Creek Canyon WSA

- 63. Deep Creek WSA
- 64. North Fork Virgin River WSA
- 65. Panguitch WSA
- 66. Swain Mountain WSA
- 67. Howell Peak WSA
- 68. Cooper Mountain WSA
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- 70. White Mountain WSA
- 71. West Mountain WSA
- 72. Cottonwood Canyon WSA
- 73. Red Mountain WSA
- 74. Layton Creek Canyon WSA

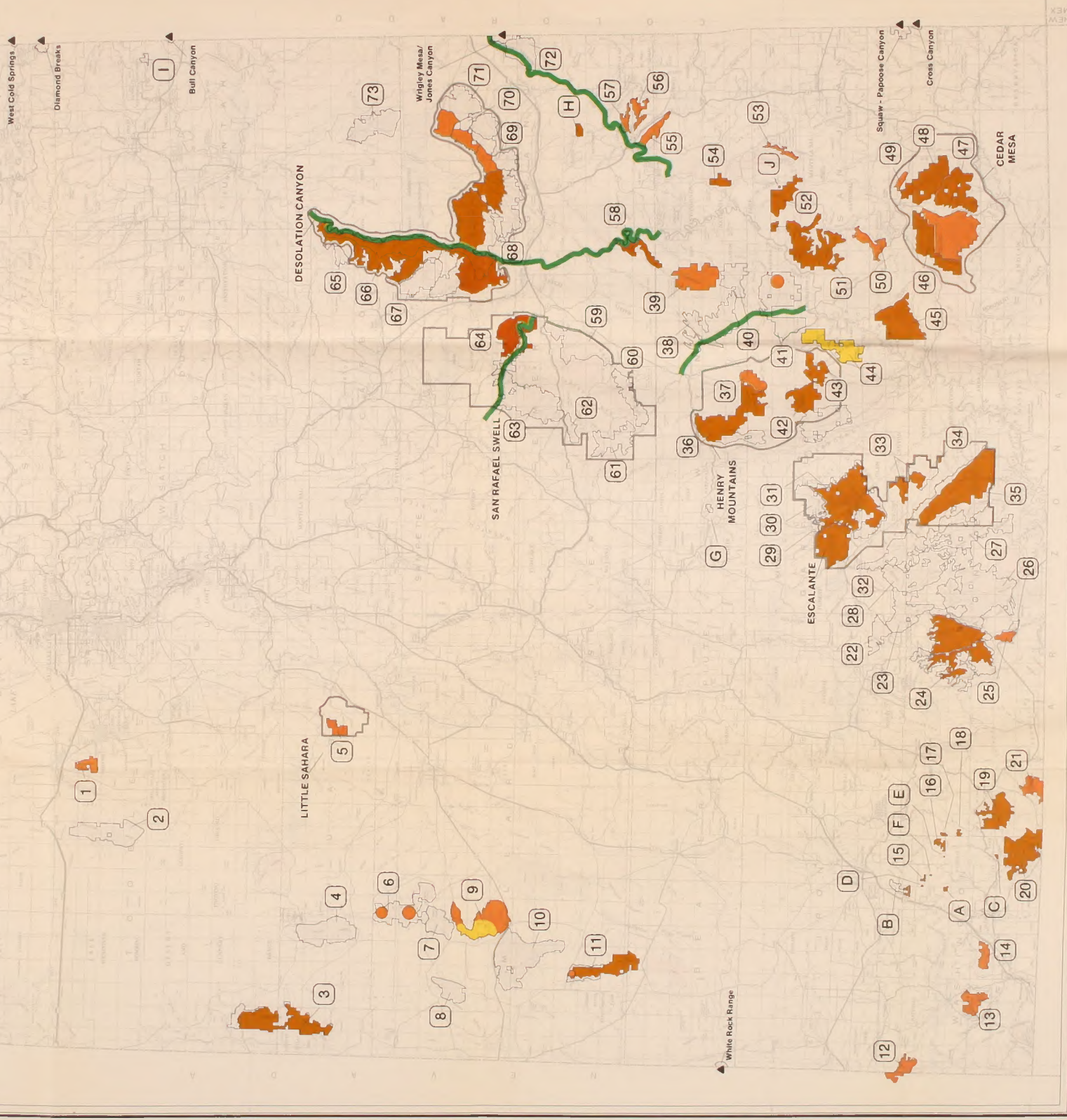
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Final

Scale: 1 inch = 10 miles
0 10 20 30 40 50 60 70 80 90 100

POCKET MAP 2 COMPREHENSIVE CONCEPT (WILDERNESS AND OTHER SPECIAL DESIGNATIONS)

- BLM WSA or Portion of WSA that would be Designated Wilderness
- BLM WSA or Portion of WSA that would NOT be Designated Wilderness
- BLM WSA or Portion of WSA to be Managed as Area of Critical Cultural Resource Protection
- BLM WSA or Portion of WSA to be Managed as National Natural Landmark
- BLM Administered Land Included for Wild and Scenic River Designation
- BLM Administered and Included for National System of Public Lands National Conservation Area Designation
- BLM WSA Under Study by Adjacent State



INDEX TO MAP REFERENCE NUMBER/LETTER

- | | | | |
|---|---------------------------------|--|--------------------------------|
| 1. North-South Mountains WSA | 16. Deep Creek WSA | 31. North Escalante Canyon/The Gulch ISA Complex | 46. Grand Gulch ISA Complex |
| 2. Capitol Reef National Park | 17. North Fork Virgin River WSA | 32. Cactus Canyon WSA | 47. Capitol Reef National Park |
| 3. Glen Canyon National Recreation Area | 18. Glen Canyon WSA | 33. Scorpion WSA | 48. Capitol Reef National Park |
| 4. Fish Springs WSA | 19. Glen Canyon WSA | 34. Escalante Canyon WSA | 49. Capitol Reef National Park |
| 5. Rockwell WSA | 20. Canyon Mountain WSA | 35. Escalante Canyon WSA | 50. Capitol Reef National Park |
| 6. Hovenweep WSA | 21. Capitol Mountain WSA | 36. Mt. Elbert/Blue Hills WSA | 51. Capitol Reef National Park |
| 7. Hovenweep WSA | 22. The Bluffs WSA | 37. Bull Mountain WSA | 52. Capitol Reef National Park |
| 8. Capitol Mountain WSA | 23. The Bluffs WSA | 38. French Spring/Happy Canyon WSA | 53. Capitol Reef National Park |
| 9. Capitol Mountain WSA | 24. The Bluffs WSA | 39. French Spring/Happy Canyon WSA | 54. Capitol Reef National Park |
| 10. Capitol Mountain WSA | 25. The Bluffs WSA | 40. French Spring/Happy Canyon WSA | 55. Capitol Reef National Park |
| 11. Capitol Mountain WSA | 26. The Bluffs WSA | 41. French Spring/Happy Canyon WSA | 56. Capitol Reef National Park |
| 12. Capitol Mountain WSA | 27. The Bluffs WSA | 42. French Spring/Happy Canyon WSA | 57. Capitol Reef National Park |
| 13. Capitol Mountain WSA | 28. The Bluffs WSA | 43. French Spring/Happy Canyon WSA | 58. Capitol Reef National Park |
| 14. Capitol Mountain WSA | 29. The Bluffs WSA | 44. French Spring/Happy Canyon WSA | 59. Capitol Reef National Park |
| 15. Capitol Mountain WSA | 30. The Bluffs WSA | 45. French Spring/Happy Canyon WSA | 60. Capitol Reef National Park |

- C. The Watchman WSA
- D. Taylor Creek Canyon WSA
- E. Groves Creek Canyon WSA
- F. Fremont Gorge WSA
- G. Lost Spring Canyon WSA
- H. Daniel Canyon WSA
- I. South Meadows WSA

- 61. Muddy Creek WSA
- 62. Devils Canyon WSA
- 63. Mexican Mountain WSA
- 64. Jack Canyon WSA
- 65. Disappointment Canyon WSA
- 66. Floy Canyon WSA
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C The Watchman WSA
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E Google Creek Canyon WSA
F Beartrap Canyon WSA
G Fremont Gorge WSA
H Lost Spring Canyon WSA
I Danielle Canyon WSA
J South Needles WSA

C The Witchman WSA
D Taylor Creek Canyon WSA
E Grouse Creek Canyon WSA
F Blairtrap Canyon WSA
G Fremont Gorge WSA
H Lost Spring Canyon WSA
I Danielle Canyon WSA
J South Needles WSA

POCKET MAP 4 - UTAH WILDERNESS
COALITION PROPOSAL



61	Muddy Creek	WSA
62	Dewitt Canyon	WSA
63	Sid's Mountain / Sid's Cabin	WSA
64	Mexican Mountain	WSA
65	Jack Canyon	WSA
66	Desolation Canyon	WSA
67	Turtle Canyon	WSA
68	Play Canyon	WSA
69	Cool Canyon	WSA
70	Spice Canyon	WSA
71	Flume Canyon	WSA
72	Westwater Canyon	WSA
73	Writer Ridge	WSA
74	Red Butte	WSA
75	Red Butte	WSA

- C The Watchman WSA
D Taylor Creek Canyon WSA
E Goose Creek Canyon WSA
F Beartrap Canyon WSA
G Fremont Gorge WSA
H Lost Spring Canyon WSA
I Daniels Canyon WSA
J South Needles WSA

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Scale: 1:100,000
0 10 20 30 40 50 Miles
0 10 20 30 40 50 Kilometers

MAP 5 - REGIONAL REPRESENTATIVE AREAS
ALTERNATIVE

- BLM WSAs or Portions of WSAs that would be Designated Wilderness with this Alternative
□ BLM WSAs or Portions of WSAs that would NOT be Designated with this Alternative
▲ BLM WSAs Under Study by Adjacent State

N

West Cold Springs

Diamond Breaks

Bull Canyon

Wipley Mesa/
Jones Canyon

White Rock Range

Squaw - Papoose Canyon

Cross Canyon

INDEX TO MAP REFERENCE NUMBER/LETTER

- 1 North Starvation Mountains WSA
2 Cedar Mountains WSA
3 Deep Creek WSA
4 Deep Springs WSA
5 Red Bluff WSA
6 Sweet Mountain WSA
7 Howell Peak WSA
8 North Peak WSA
9 King Top WSA
10 King Top WSA
11 King Top WSA
12 King Top WSA
13 Red Mountain Road Mountain 201 WSA
14 Cottonwood Canyon WSA
15 Lakeview Creek Canyon WSA

- 16 Deep Creek WSA
17 Deep Creek WSA
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19 Cottonwood Canyon WSA
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- 31 North Escalante Canyons/The Gulch ISA Complex
32 Calaca Canyon WSA
33 Escalante Canyons Tract 6 ISA Complex
34 Fifty Mile Mountain WSA
35 Fifty Mile Mountain WSA
36 Mt. Elmer-Blue Hills WSA
37 Mt. Elmer-Blue Hills WSA
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POCKET MAP 6. PARAMOUNT WILDERNESS
QUALITY ALTERNATIVE

- BLM WSAs or Portions of WSAs that would be
Designated as Wilderness with this Alternative
BLM WSAs or Portion of WSAs that would NOT be
Designated as Wilderness with this Alternative
BLM WSAs Under Study by Adjacent State



West Cold Springs

Diamond Breaks

Bull Canyon

Wrigley Mesa/
Jones Canyon

Squaw - Papoose Canyon

Cross Canyon

White Rock Range

INDEX TO MAP REFERENCE NUMBER/LETTER

- 1 North Steeply Mountains WSA
2 Deer Creek WSA
3 Fish Springs WSA
4 Fish Springs WSA
5 Rockwell WSA
6 Rockwell WSA
7 Rockwell WSA
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14 Rockwell WSA
15 Rockwell WSA

- 16 Deep Creek WSA
17 North Fork Virgin River WSA
18 Pinedale Canyon WSA
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- 31 North Escalante Canyon/The Gulch WSA Complex
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- 46 Grand Escalante WSA Complex
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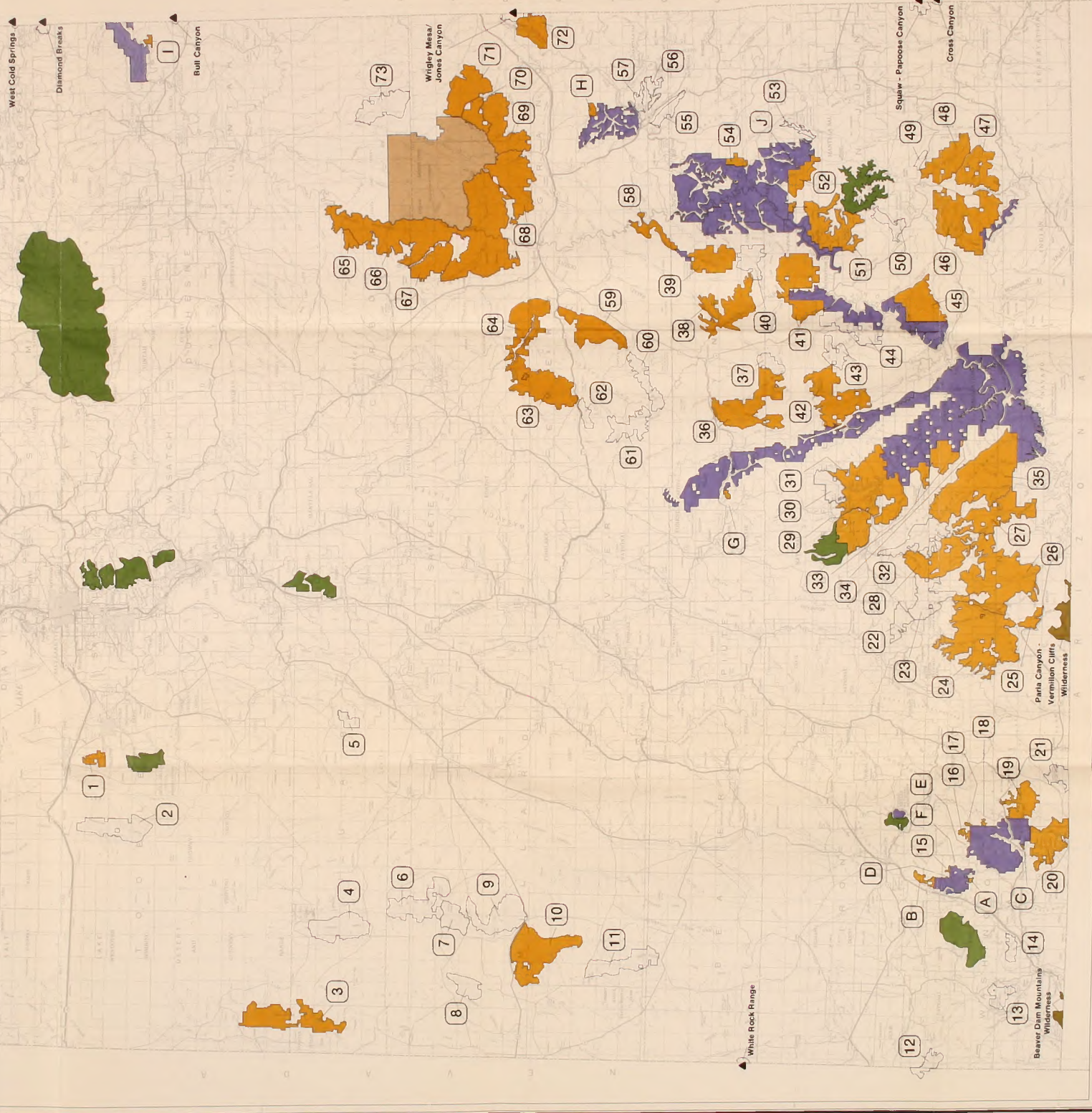
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Scale 1:500,000
0 10 20 30 40 50 Miles
0 10 20 30 40 50 Kilometers

POCKET MAP 7 - CLUSTER AND INTERAGENCY
AREAS ALTERNATIVE

- BLM WSAs that would be Designated Wilderness with this Alternative
- BLM WSAs that would NOT be Designated Wilderness with this Alternative
- BLM Designated Wilderness Areas
- National Forest Designated Wilderness Areas
- National Park System Proposed Wilderness Areas
- Other Land Managed for Wilderness Values
- BLM WSAs Under Study by Adjacent State



INDEX TO MAP REFERENCE NUMBER LETTER

- | | | | |
|--------------------------------|--|-----------------------------------|----------------------------|
| 1 North Sandburg Mountains WSA | 46 Grand Gulch USA Complex | 81 Mulder Creek WSA | 89 Tropic Canyon WSA |
| 2 Deep Creek WSA | 47 Road Canyon WSA | 82 Devils Canyon WSA | 90 Taylor Creek Canyon WSA |
| 3 North Fork Virgin River WSA | 48 Escalante Canyons/Tee Gulch USA Complex | 83 Silt Mountain/Silt's Cabin WSA | 91 Beartrap Canyon WSA |
| 4 Fish Springs WSA | 49 Escalante Canyons/Tread & USA Complex | 84 Mexican Mountain WSA | 92 Lost Spring Canyon WSA |
| 5 Piute Mountains WSA | 50 Piute Mountains WSA | 85 Desolation Canyon WSA | 93 Daniels Canyon WSA |
| 6 Huelmo WSA | 51 Dark Canyon USA Complex | 86 Turtle Creek WSA | 94 South Needles WSA |
| 7 Huelmo WSA | 52 Buller Wash WSA | 87 Spruce Canyon WSA | |
| 8 Conger Mountain WSA | 53 Indian Creek WSA | 88 Spruce Canyon WSA | |
| 9 King Top WSA | 54 Behind the Rocks WSA | 89 Spruce Canyon WSA | |
| 10 King Top WSA | 55 Behind the Rocks WSA | 90 Spruce Canyon WSA | |
| 11 King Top WSA | 56 French Spring/Happy Canyon WSA | 91 Spruce Canyon WSA | |
| 12 Googler Canyon WSA | 57 French Spring/Happy Canyon WSA | 92 Spruce Canyon WSA | |
| 13 Googler Canyon WSA | 58 French Spring/Happy Canyon WSA | 93 Spruce Canyon WSA | |
| 14 Coffeywood Canyon WSA | 59 French Spring/Happy Canyon WSA | 94 Spruce Canyon WSA | |
| 15 LaVine Creek Canyon WSA | 60 French Spring/Happy Canyon WSA | 95 Spruce Canyon WSA | |
| | 61 French Spring/Happy Canyon WSA | 96 Spruce Canyon WSA | |
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| | 65 French Spring/Happy Canyon WSA | 100 Spruce Canyon WSA | |
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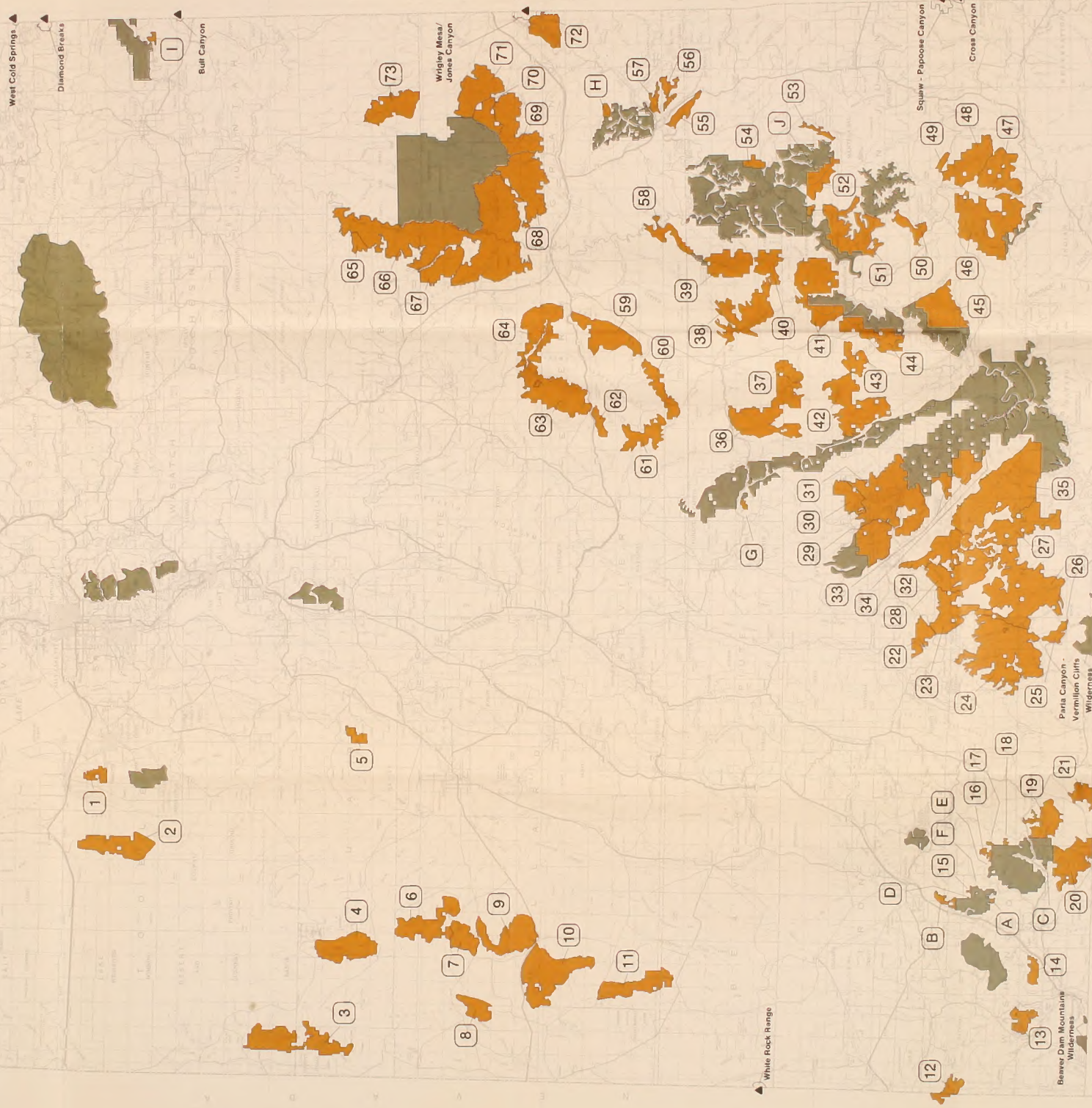
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Scale 1:500,000
POCKET MAP 9 - ALL WILDERNESS ALTERNATIVE

- WSAs that would be Designated Wilderness with
this A Alternative
WSAs that would be Designated, Proposed, or Managed
For Wilderness
BLM WSA Under Study by Adjacent State

North Arrow



INDEX TO MAP REFERENCE NUMBER LETTER

- | | | | |
|--------------------------------|---|-----------------------------------|---------------------------|
| 1 North Steeples Mountains WSA | 31 North Escalante Canyon/The Grand Staircase-Escalante National Monument | 61 Maple Creek WSA | 88 The Weichman WSA |
| 2 Deep Creek WSA | 32 Carcass Canyon WSA | 62 Devils Canyon WSA | 89 Goose Creek Canyon WSA |
| 3 North Steeples Mountains WSA | 33 Scorpion WSA | 63 Sid's Mountain/Sid's Cabin WSA | 90 Bearpaw Canyon WSA |
| 4 Fish Springs WSA | 34 Scorpion WSA | 64 Mexican Mountain WSA | 91 Bearpaw Canyon WSA |
| 5 Roswell WSA | 35 Fifty Mile Mountain WSA | 65 Desolation Canyon WSA | 92 Lost Son WSA |
| 6 Roswell WSA | 36 Mt. Elbert/Blue Hill WSA | 66 Turkey Creek WSA | 93 Devils Canyon WSA |
| 7 Roswell WSA | 37 Mt. Elbert/Blue Hill WSA | 67 Turkey Creek WSA | 94 South Needles WSA |
| 8 Copper Mountain WSA | 38 Indian Creek WSA | 68 Turkey Creek WSA | |
| 9 Copper Mountain WSA | 39 Horseshoe Canyon (South) WSA | 69 Turkey Creek WSA | |
| 10 Copper Mountain WSA | 40 French Spring/Happy Canyon WSA | 70 Turkey Creek WSA | |
| 11 Copper Mountain WSA | 41 French Spring/Happy Canyon WSA | 71 Turkey Creek WSA | |
| 12 Copper Mountain WSA | 42 Mt. Hermit WSA | 72 Turkey Creek WSA | |
| 13 Copper Mountain WSA | 43 Little Rockies WSA | 73 Turkey Creek WSA | |
| 14 Cottonwood Canyon WSA | 44 Little Rockies WSA | | |
| 15 Laverne Creek Canyon WSA | 45 Mancoska Mesa WSA | | |

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